AN ENGINEER'S HOLIDAY

OR NOTES OF A

ROUND TRIP FROM LONG. 0° TO 0°

BY

DANIEL PIDGEON, F.G.S., ASSOC. INST. C.E.

IN TWO VOLUMES

VOL. I.—WEST

LONDON
KEGAN PAUL, TRENCH & CO., 1, PATERNOSTER SQUARE
1882

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PREFACE.

A TOUR of the World makes many radical changes in those ideas about foreign countries which are insensibly gathered in the course of time from the reading of books and newspapers.

I landed in America, a prospective admirer of its people and institutions, and left it, after five months' stay, charmed with the courteous kindness of its private citizens, astonished at the breadth and boldness of the national mind, and convinced that, so far as power and prosperity are concerned, the great republic is on its way to become the foremost nation of the modern world. But I looked for political enthusiasm, intellectual aspiration, and republican simplicity of life among the people of the United States. I found politics a close profession, material well-being the goal of ambition, and luxury rampant among the rich.

I believed that the Japanese were, next to the white races, the most advanced people in the world, whose intelligent appreciation of a civilization higher than their own had led to the overthrow of a remotely

ancient social and political system, too rigid for Western ideas of progress. I found them cultured, courteous, and charming; but insincere and reactionary in policy, unbusiness-like and untrustworthy in affairs.

I thought that the Chinese were a stationary people, prejudiced, dishonest if not vicious, and the slaves of a degrading form of self-indulgence. I found them cold and ungenial, it is true, but acute and enterprising men of business; industrious, orderly, and reliable workers; economical and abstemious in their habits; a real benefit to the foreign countries where they settle; but impoverished and hampered in their otherwise certain development at home by the tyranny of a corrupt and alien rule.

I imagined that India was a rich extension of the British Empire, with more to give, whether of wealth or strength, to England than to gain from her. I found her the poorest country in the world, which, strain our strength as the task may, we are in honour bound to dower with security, peace, justice, and culture; all the blessings, in fact, of civilized rule.

These are my excuses for having thrown some private notes of travel over trodden ground into the form of a published book. I shall be glad if my readers find in the volumes themselves any other justification for their appearance.

LONDON, *April*, 1882.

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CHAPTER I.

THE ATLANTIC—NEW YORK.

April 17—*May* 4, 1880.

THE Atlantic was crowded with icebergs during the spring and early summer of 1880, but the prudent captain of our steamer the *Algeria* took us too far south to see them. We thus missed a spectacle which the steamship *Belgenland* enjoyed a month later, when in latitude 43° N., she passed two fleets of bergs—one on either side of the Newfoundland Banks—numbering together not less than a hundred, the largest of which was a mile long, and towered two hundred feet above the water.

Any one who doubts the theory that climate is dependent on ocean currents should sail the North Atlantic. It is a witches' caldron where two immense

streams of hot and cold water meet but do not mingle, though they are so closely apposed that a ship may pass in her own length through temperatures differing by twenty degrees. When the prevalent westerly wind shifts a few points to the south, it coincides with the Gulf Stream, and saturated with its warm vapours, prostrates the ship's passengers with the atmosphere of a hot-house. When on the other hand it veers a little north, it brings the cold of the polar current over the starboard bow and sends every one hurrying below for ulsters. There is no equilibrium and consequently no peace in such a sea where a flat calm at breakfast, a gale at noon, and a halcyon sunset may all be expected. Thus a shift of the wind from south-west to north-west brought us on one occasion a succession of fog, warm sunshine, tropical rain, and heavy snow, within a few hours, while, to complete the meteorological variety, night dressed our yards and masts with St. Elmo's fire. The shining trail which streams from our screw is singularly sensitive to these changes: when the wind is warm the wake is brilliant with phosphorescent animals; when cold there is hardly a sparkle.

Although the *Algeria* is a slow ship we make three hundred miles a day in favourable weather, but this is reduced to less than two hundred whenever there is much head wind. It does not pay to drive a vessel of this kind too hard; you may burn the coal but without getting a corresponding speed out of her. On the

other hand, crack steamers like the *Britannic* can be advantageously forced in the teeth of a gale, and this is why the "tubs" are not badly beaten in fine passages though they may be four or five days longer than the clippers in crossing when the wind is adverse.

The captain's cabin is socially a very agreeable resort, and illustrates the age we live in. Darwin's "Origin of Species" and Spencer's "Sociology" are on the book-shelves, while a recent French novel lies on the chart-table. These books would surprise the captain of an East Indiaman of twenty-five years ago, who was usually learned in no arts but seamanship, and read in no other literature than the log.

The passage of the North Atlantic is much like other voyages until the seventh or eighth day, when the steamer crosses the polar current—that region of mists and bergs. Then very often the air thickens without warning to the consistency of a London fog; the whistle shrieks its warning from minute to minute; the captain keeps the bridge and is not seen at meals; every one is chilly and apprehensive. If you go forward, braving the rimy air, there stand the watch like statues, every faculty of their being concentrated in their eyes.

When under these circumstances the thermometer suddenly drops, it is known that somewhere behind the veil of yellow mist ice is close at hand. But the speed is not slackened, way being kept on the ship in order that if the moment for action comes she may answer

her helm. quickly and easily. Thus, instinct with a painful watchfulness, the great steamer advances in the gloom to whatever may befall. If a berg is sighted while still half a mile off, all will be well, for there is time enough with a speed of twelve knots to alter the course, but one does not care to think of what would happen if the keen eyes on whose acuteness the safety of the ship depends should be baffled by the fog.

In the happy absence of such incidents the time of our passage passed quickly and pleasantly, and in view of the early break-up of some pleasant intimacies, we hailed the pilot with regret. He picked up the *Algeria* while she was still a hundred and ninety-five miles distant from New York, and such is the competition among these men that their handsome schooners are sometimes met three hundred miles away from shore.

It was midnight when we anchored in the harbour of New York and were boarded for the mails by a characteristic American steam-tender. This vessel was a small steamer with big paddles and a great "walking beam" oscillating above a high maindeck. Over her masthead hovered a gigantic gilt eagle, whose outspread wings seemed to cover the ship from the waist to the bow. In the wheel-house, an elegant circular saloon enclosed with sliding plate-glass panels, sat the master, whether mariner or mechanic it would be hard to say, smoking, lounging, and steering. There was nothing in the skipper's manner to indicate which of

these three occupations was the most important and his superintendence of the mail transfer had the same casual, unofficial air. But the work was very quickly done, and already we began to discern that we had reached a country where officers can be smart without uniforms, and where no man's profession can be inferred either from his clothes or his manners.

Henry Hudson was seeking in a third voyage that passage to the Indies which was the dream of the seventeenth century, when he anchored, in 1609, near Sandy Hook. No white man had ever before sailed up the noble stream that bears his name, but beautiful as he thought the "Groot" (Great) River, he never saw it again, for the Dutch East India Company cared nothing about its exploration, since it did not lead to India.

Wise James I. had before this chartered two companies for the purpose of colonizing North America, but kept them a hundred miles apart in order to prevent their quarrelling, and into that vacant space Holland, after Hudson's discoveries, naturally slipped, founding the territory of New Netherlands. Next year (1614), Adrian Block, trading in skins, lost his ship by fire and wintered with his crew in log huts on Manhattan Island, which was bought from the Indians ten years later for £24 sterling by the Dutch.

New England and New Netherlands never agreed, while Block's town of New Amsterdam grew but slowly

under an inelastic colonial system, so that in the course of time the New England emigrants surpassed the Dutch in numbers and wealth. At length, after many quarrels, the town fell to an English fleet in 1664, changing its name to New York in honour of the king's brother to whom Charles II. gave the province. The city long retained the Dutch language and many Dutch peculiarities. Dutch names are still common, while the Jour de l'An, Easter eggs, Santa Claus, and other Continental festivals have become incorporated into American life and manners.

One cannot step for the first time on American soil without some retrospection. History we know will soon be forgotten in the roaring streets of New York; but while our steamer threads her way through the crowded river to the quay, a first and last thought of Henry Hudson's voyage past these banks, then "pleasant with grass and flowers and goodly trees," where Indians came to meet him in canoes "made of single hollowed trees," scarcely three hundred years ago, is not out of place.

New York is unattractive at a first glance. It is English in its business-like air but with a Continental varnish. The houses are built in square blocks, usually of red brick, very high, and with windows shaded by green jalousies. Here and there are some fine buildings, as the Post-Office, the newspaper offices, and a few very large stores, but the city possesses no dominating architectural features. The "elevated railroads," carried

through the streets on staging at the level of the first-floor windows, are convenient but extremely ugly. Neither does a Londoner easily accustom himself to the sight of innumerable telegraph wires stretched along rough posts throughout the city. The Americans themselves have not a word to say for their badly paved roads, or for the absence of a decent system of cabs. Street locomotion is carried on entirely by trams and omnibuses, the rails of the former being laid in such a manner as to make carriage traffic almost impossible, while the latter are excellent liver-shakers, but have no other merit. The bad roads are worse kept. Broadway itself is thickly littered with the *débris* swept from shops and warehouses, which it is apparently no one's business to remove. Boxes and casks, containing domestic refuse, stand out on the side-walks before every door in many of the good streets. The municipal cleanliness of Paris or London is quite unknown.

But no sooner does one pass from the street into the house than all is changed. Within the public and private offices, stores, and warehouses of the city, order, neatness, and comfort are supreme. While successful merchants and professional men in London often spend the business day in dark recesses of grimy old houses, their American brethren are lodged luxuriously and surrounded by the last appliances for the easy conduct of work, from a newly patented bill file to the telephone or telegraphic printer. "I guess we live the most of

our lives here and expect to be comfortable," said a friend to whom I expressed my sense of the contrast.

The wish for comfort and luxury is a striking American trait. It shows itself in the adoption of everything that tends to reduce friction in daily life. It dictates the complex but convenient hotel system, the sale of railway tickets at offices on the street, the general use of the lift, the type-writer, the telegraphic printer, and the telephone. It is seen in the fitting and furnishing of a merchant's office, from the handsome decorations to the comprehensive bureau, the scientific safe, and the easy-chairs. If the street gives an impression of makeshift and seems to partake of the camp rather than the city, the warehouse and store are palaces where nothing is too good for the entertainment of industry.

And one soon becomes aware that industry occupies very different positions in England and America. We worship other gods beside our occupation. To possess land and enjoy the influence it brings, is an ambition with most of our merchants and manufacturers. By our unwritten code of caste, the trader, as in the half-civilized East, stands below the soldier and the landed proprietor.

The American man of business on the other hand owns no divided allegiance, his own work interests him above all other things; and whether he runs a barber's shop or rules a great factory, he has but one aim—to be

"Up Town" and "Down Town," Fifth Avenue and Wall Street, are the opposite poles of New York life and society, just as the City and West End are with us. Down Town life is much like our own though more excited and feverish. The English visitor however has heard of the go-ahead Yankee, and being prepared for unusual commercial activity finds the merchant no more speculative than he expected. But the life which fills Fifth Avenue in the afternoon astonishes and perplexes him not a little. Magnificent carriages, rich liveries, costly horses, and splendid toilettes, crowd the fashionable quarter. An air of unbridled luxury pervades the scene and there is no public drive in Europe where gold flows in a deeper stream. Yet side by side with this pomp walks republican equality in a mechanic's suit—a figure which would seem out of place among such surroundings anywhere else in the world; while here, the man of the people eyes and enjoys the spectacle without envy or sense of inferiority, soberly hoping that one day all this may be his.

The case illustrates the essential difference between democracy in America and in Europe. The lives of the vast majority of European workers run in grooves which have been cut so deep by time and custom, that to "do their duty in that station of life in which it has pleased God to call them," is all that is practically within the power of the masses. Hence the democrat, feeling the

hopelessness of rising, would drag others above him down. No such grooves exist in the States, where it has "pleased God" to place any station within the reach of every man, and where consequently every worker hopes to rise. Luxury and labour elbow each other good-humouredly enough on the brilliant side-walks of Fifth Avenue, and the new-comer finds both the love of the first, and its complacent tolerance by the last, a complete surprise.

The churches of New York are very numerous but generally without architectural merit, exception being made of the new Catholic Cathedral, a beautiful Gothic pile of pure white marble worthy of any country or age. The characteristic American churches must be sought in Fifth Avenue, and if few of them are of striking design externally, they are beautifully decorated and luxuriously fitted within. "Religion is nothing in this country if it is not comfortable," said the minister of one of these chapels-of-ease; and certainly the hard seats of an Anglican church offer a strong contrast with the couches of a New York place of worship.

Mechanical ventilation, softly carpeted aisles, deep seats and thick cushions, warmth in winter, coolness in summer, good music, and popular preachers,—these are the things which make religion comfortable here. But fans strew the sittings; no one kneels to pray or stands to sing; and the service is heard, like an opera, from a luxurious stall. It is not only at the Madeleine one

may see pretty, perfumed sinners, who give themselves up for a moment to holy thoughts, slipping a well-gloved hand under the bonnet for a hasty examination of the chignon, and slily surveying the neighbouring toilettes, only when the soul has satisfied its divine aspirations. The American spends freely, whether on self, wife, or church. Not only is a high rent paid for sittings but the privilege of occupying these is annually sold at auction and large premiums are thus obtained. The money is spent in procuring the best available preaching talent and congregations pride themselves on possessing distinguished men; while under this quasi-competitive system, popular divines command large incomes and a high social position.

I found the Rev. Henry Ward Beecher's church at Brooklyn densely filled with a congregation of the wealthy "upper classes." Comfort as usual reigned in all the arrangements, the flock listening to both pastor and choir from luxurious fauteuils. Christianity and cushions have certainly "kissed one another" in New York. The pursuit of material success may be said to engage the whole attention of Americans at present. There are highly cultured circles in all the eastern cities but they are out of harmony with the mass of well-to-do citizens, retiring in habit, and exclusive in manner. Plymouth Church is recruited not so much from this class as from the intelligent, active, ambitious, and wealthy commercial order, who yearn, like other

men, for the higher life which material success cannot give. But while the rebound from the prose of existence is idealistic in character among cultured men, it is always spiritualistic in the case of a congregation such as I have endeavoured to depict. Hence, as might be expected, Mr. Beecher's sermon was an eloquent and passionate plea for doubling the life of the city with the ecstasy of the saint—the message of the camp meeting, enlarged, refined, and adorned as befitted his audience; satisfying while it stimulated the needs of emotion, but leaving the intellect starving.

The great river ferries are an important feature of New York. There are at present no bridges across the Hudson or East rivers, and communication between the city and Brooklyn and Jersey City, its extensions, is by steam ferry. The boats, or rather flats, are of gigantic dimensions, very comfortably fitted, and beautifully kept. There are spacious saloons for passengers, deck space for waggons, and a bar for refreshments. Bow and stern are alike, bluntly rounded and fitting accurately into corresponding recesses in the wharves, so that passengers and teams go on board as if on a continuous road. The transit is made quickly and quietly and the service is so perfect that the inconvenience of an island situation is hardly felt by New Yorkers. A great suspension bridge will shortly connect New York and Brooklyn, but will hardly surpass the ferries in convenience. As the railway termini lie across the Hudson,

each railroad company has its ferry, and once on board the boat one is practically already in the cars.

The visitor who lands in America believing that a dollar in New York equals a shilling in London, is nevertheless astonished not so much at high prices as at their capriciousness. While he can live like a prince for sixteen shillings, or like a gentleman for twelve shillings a day, he cannot buy the *Herald* for less than twopence-halfpenny, though the publishing price is three-halfpence. Shaving costs a shilling, and a drink the same sum. A shoe-black demands fivepence for his services, and a cabman is occasionally to be found who will jolt body and soul asunder over the wretched roads, at the rate of eight shillings an hour. Competition is not popular in America. Every-body wants large profits. From rival railroads to rival retailers, every one prefers combination to competition. Even the buyer is a consenting party. He likes paying a high price, and such artificial values as the above, which seem ridiculous to a new-comer, are cheerfully approved by Americans. Some people explain all this by saying that commerce in the States has been reared upon protection; but the Yankee, though a smart man of business on the surface, is a republican sentimentalist not far below, and gives a benevolent width to the proverb, "Live and let live," wherever the claims of labour are concerned.

CHAPTER II.

ON THE RAILROAD.

May 4.

I FOUND myself at the New York depôt of the Pennsylvania Railroad, bound for Washington, with no bones broken, after a cab ride from the Brevoort House to Desbrosses Street. In the baggage office a numbered brass plate was strapped to each of my pieces, and duplicate checks having been handed me, I strolled off free of all impediments, to buy a seat in the Pullman "parlour car." The transaction, which is rather like taking a stall for the opera, resulted in my pocketing a piece of paper with "Car No. 2; Seat No. 30," printed thereon and this was my reserved seat for the journey. "Parlour cars," used for day travelling, are handsome rooms of gilded walnut-wood, furnished with numbered easy-chairs. A smoking-room and lavatory are attached to each carriage and a servant is in attendance who, if politely asked, will lay a lunch, cool wine, or bring iced water from the reservoir.

Every American thinks the national system of

travelling vastly superior to ours, but there is a good deal to be said on both sides of the question. Setting Pullmans on one side for the moment, the ordinary "cars" are long carriages holding about forty passengers disposed in rows two deep on either side of a central gangway. The space allotted to each person is very small. The seats are thinly cushioned and have pivoted iron backs which swing over to "face the horses," whichever way the train goes. There is no room to carry wraps or small baggage unless the neighbouring seat is unoccupied; the traveller himself is cramped during the day and sleeping at night is impossible. On the other hand, he is free to wander from car to car, or divert himself on the platform outside; iced water is always at hand in summer, and the carriage is warmed in the winter. The newsboy keeps a comprehensive store-box in the corner and is always peddling literature, candy, cigars, and pea-nuts in the gangway. The Pullman "parlour" and "sleeping-cars," have each their good and bad points. In the former upholstery has been considered before comfortable easy-chairs; while the latter, though giving an excellent bed, are too stuffy at night, and the day seats are singularly angular. All drawbacks notwithstanding, railroad travelling is not fatiguing in America, the freedom to move about affording so much change and rest.

Railway companies compete for custom by adver-

tising comfort and safety, in a way of which we know nothing in England. Their time-tables, often pictorial and descriptive pamphlets, boast of "rock road-beds, steel rails, the Miller platform and coupler, and the Westinghouse brake;" or exhibit maps whose topography is seductively direct.

The speed of the Washington express does not exceed thirty-five miles an hour, but new locomotives with six-and-a-half-feet driving-wheels are now in course of construction which will compass the distance from New York to Philadelphia, ninety miles, in as many minutes. Engines with small coupled driving wheels are in general use in the States, and they suit the rougher tracks and heavier grades of the railways very well. A really fast train between New York and the political capital is however much wanted, and the Pennsylvania Railway Company have lately made such improvements in their permanent way as will permit the use of speeds like our own over this section of their line. American locomotives are second to none in design and workmanship, though the cow-catcher, spark-arrester, big bell, and driver's "cab" look strange to unaccustomed eyes. All these things, however, have their *raisons d'être* in a country of unfenced lines, forest fires, street stations, and extreme temperatures. Automatic brakes are universally applied in the States, but the points and crossings, switches and signals, are far behind our own in merit.

The bridges along the line are all of one type; trussed iron girders, much lighter and more graceful in appearance than our own. The Susquehanna river is crossed by an exquisite structure of many spans, which looks like a spider's web in the distance.

The American love of comfort provides some welcome accommodation in the Pullman cars. Our train for example allowed no time for refreshment by the way, but an "agent" took orders for lunches as we approached Philadelphia, whence they were telegraphed on to Wilmington. On reaching this place half an hour later, a man came "aboard" with a pile of flat baskets, each of which opened across the knees into a white-napkinned table, and enabled one to lunch as comfortably as in the dining-room of an hotel. Whenever the train stopped a boy passed quickly through carrying telegraph forms in his hand and crying, "Messages to all parts of the world!" which might be sent without rising from a luxurious seat. Finally the express agent inquires your destination and the name of your hotel, receives your checks, and gives you his own in exchange, stating that your baggage will be in your bedroom on your arrival. This is an independent service paid for at the uniform rate of twenty-five cents or a shilling per package, and the English traveller soon learns why Americans travel with only one trunk apiece, and if he is an economical man, at once despatches his hat-box and superfluous

bags to await his return in New York. If there were decent roads and cabs in the country I should not give the prefcrence to the express man, who is by no means so prompt as he represents himself to be, but he is a necessity in America.

Railroad tickets are sold at all sorts of prices, and the dearest place to buy them is at the booking office. The companies make contracts with agents, to whom they allow heavy discounts, and where there is much competition these men undersell one another. The rate per mile is less for long than for short journeys and a smart man going west—to Omaha for example —will book through to San Francisco and sell the balance of his ticket on the train. The "conductor" again issues tickets in the train at "conductor's prices," the tariff of which may or may not be posted in the cars, and if changes in the traveller's plans should make it convenient to book in this way there is always an unknown loss on the transaction. The whole system is distasteful to the English tourist who has not learned how to bargain for his tickets, and never knows to what extent he has been "bled."

All the way from New York to Washington the road is flanked with advertisements, painted in gigantic letters upon every gable, shed, fence rail, or boulder which can be seen from the train. The state of New Jersey appears to be given over to a quack, who is never tired of repeating, "Try Schenck's Seaweed Tonic!" "Take

Schenck's Mandrake Pills!" "Schenck against the world for mild aperients!" If the Yankee tradesman could reach the rainbow with a paint-brush, he would worry heaven to "Try Hop Bitters!" or chew "Gail and Ax's Navy Plug!"

CHAPTER III.

WASHINGTON.

May 5–9.

WASHINGTON has been aptly called "The City of Magnificent Distances." It is five miles long by three miles wide, but only a small portion of this area is built over. The site was chosen by Washington himself, who laid the corner-stone of the Capitol in 1793, and seven years later the seat of Government was shifted from Philadelphia to the city built for its reception.

The national metropolis was laid out on the same scale as the national hopes for its future; but man only proposes, and the population, which was planned for millions, had not reached 150,000 in 1875. Meanwhile the distances remain. Pennsylvania Avenue, the principal street, is a hundred and sixty feet wide. From the Capitol as a centre it is a mile and a half to the Treasury and White House; a mile to the Post-Office and Department of the Interior; and a mile in another direction to the Smithsonian Institution; while the United States Naval Observatory lies in latitude 38° 53′ and longitude 77° 8′, entirely out of reach in a

cabless country. All this is magnificent, but it is not common sense. The stores and private houses "make believe very strong," and during the session of Congress almost persuade the visitor that he is in a first-class city. Washington at any rate has good roads and is well paved. At the time of the civil war its streets were bottomless bogs, now they are models for the rest of the Union.

The traveller's attention is first arrested, not by the fine public buildings of the city, but by the negroes. New York, without his knowledge, has already stood for the portrait of America, and the sight of black faces is a surprise, recalling the separate identity of the South, and suggesting questions, once more disquieting than they are now,—Will the South finally amalgamate with the dominant section of the nation? and, What will become of the negro? For my own part I believe that the amalgamation will take place. The great estates are breaking up; the contempt of trade is breaking down. Manufactories are rising. Northern capital is welcomed. The new generation begins to follow mercantile and mechanical pursuits. Men who despised business take an interest in the multiplication of factory chimneys. These are signs of the times which point to the ultimate adoption of Northern ideas of progress and development. The negro on the other hand is in course of absorption. From some unascertained cause, this race, so prolific in slavery,

does not increase when free. Black blood tends by preference to mingle with white and may do so since the abolition of the Southern marriage laws. Emigration is carrying large numbers of coloured men westward, where white marriages or death will thin their ranks. Thus the questions to which no reply was possible fifteen years ago may be answered hopefully to-day.

The State buildings of Washington are much more magnificent than we in England are apt to suppose. The Capitol is probably one of the finest public buildings in the world. The Treasury is a splendid classic pile of grey granite. The Post-Office and Department of the Interior are white marble palaces; while the Smithsonian Institution is a beautiful Romanesque building of warm red sandstone. It is worthy of note that the dome of the Capitol is built entirely of iron, though there are no external indications of this, the material being used with great architectural skill.

The gallery of the House of Representatives is open to all the world, and I entered it with very mixed views about the American Parliament. On the one hand I was prepared for a perfunctory discussion in a noisy House, whose members were engaged with their own rather than with public affairs. On the other I had some expectation of hearing hard names, if not pistol-shots, exchanged across the floor. But we are taught to expect too much by our newspaper writers and I was

A Bill for extending the Congressional Library was under consideration. The speeches were excellent and attentively listened to. Republican freedom certainly dispensed with ceremony to a remarkable degree in the customs of the House, but I saw nothing that impaired the dignity of a legislative assembly.

One soon learns that "politics" and "politicians" are opprobrious names in the States. The former is a disreputable profession; the latter are "scallowags." Americans are never tired of denouncing both, and almost always attribute their degradation to universal suffrage. In this I think they are wrong. It is quite true that a political machinery exists which is operated for the benefit of professional politicians, but these men, unscrupulous as they are, are really controlled by a healthy public opinion. There are doubtless persons who would sacrifice even national honour and good faith for their own advantage, but if masters of the political situation, they are nevertheless servants of the people, whose soundness is proved by the limits which they unconsciously impose on those who manipulate the popular vote. If the masses were really unfit for the franchise, "politicians" might easily become dangerous enemies of the common weal, instead of the mere self-seekers they are. The degradation of political and municipal functions in America is in truth due to neglect of their public duties on the part of citizens who are too much engrossed in their own affairs; and all that is required

for the purification of politics is that the natural leaders of the people should reassume responsibilities which in the early days of the republic were sought, not shirked, by the best men in the country. The professional politician will die hard no doubt; but dissatisfaction with the present state of things is so general, and the Americans are so capable, as the Tweed affair proved, of "straightening out" admitted difficulties, that the proper remedy will be applied before long, and we shall hear no more about the evil results of universal suffrage.

The Treasury is one of the finest public buildings in Washington, second only to the Capitol in architectural excellence. The national paper currency is manufactured here, and in its great safes are kept the deposits of all the national banks in the country. The banking system of America was legislatively remodelled shortly after the war, and private banks were everywhere replaced by national banks, established under conditions requiring a certain relation between capital and population, the deposit with the Treasury of national bonds equal to one-third of such capital, and State supervision of the accounts. Any banking corporation having complied with these conditions is entitled to receive and issue Treasury notes amounting to ninety per cent. of its deposit in the Government safes. The security of the public under this system is very great, and "greenbacks" are current everywhere

at their full value, an advantage which will be appreciated by every one who has tried to change local notes in England, or the paper of the Bank of Bengal, a State institution, in any other Indian Presidency. Treasury notes practically supersede metallic money in the States, the clumsy silver dollar is hardly ever seen, and the small change carried in the pocket consists of "quarters," ten-cent pieces, and "nickels." The first is like our shilling in size and value, the second like our sixpence, and the last is a plated coin value twopence halfpenny. There are copper cents in America, but as nothing costs less than a nickel, they are of no value to the traveller.

The Treasury deposits amount to such vast sums, that special safes, secured by "time locks," are used for their reception. The latter consist of an ingenious combination of chronometer and lock, whose bolts cannot be shot except at nine o'clock every morning and for ten minutes after that time. Three officials, each provided with a combination of letters only known to himself, must all be present in order to unlock the safe. If the door is not opened during the ten minutes in question, the clock secures it as before until the same hour on the following morning.

Some clever forgeries are shown in the Redemption Office, a department for receiving and exchanging worn-out or mutilated greenbacks. In one case fifty 500-dollar notes were each cut across into fifty narrow strips. One

strip was then taken from each note in regular succession, and the fifty abstractions pasted side by side on a piece of paper, making a new 500-dollar bill. Each of the original notes, consisting now of forty-nine strips only, was similarly backed, the absence of one narrow strip being easily overlooked. When the trick was detected it was found that the process, which no one had anticipated, was not illegal and the ingenious operator consequently escaped punishment.

The acknowledged pre-eminence of Americans in the mechanical arts is largely due to their patent laws, and the Patent Office at Washington is a department specially interesting to Englishmen. It costs £30 to protect an invention for six months in England, and nearly £200 to secure it for the full term of fourteen years. Our patents are issued to all applicants, without any official examination into the novelty of the process sought to be protected, and an inventor must therefore ascertain by a laborious search through the records, whether his or any similar scheme has been previously patented. All this puts patents entirely out of reach of our working men, who as a matter of fact do not invent.

The cost of a patent in the United States, protecting the inventor for seventeen years, is only £7. Examiners determine whether an invention is novel, thus saving the cost of a search. Classified models of every patented

it easy to ascertain what has been previously done by others. It is not difficult for an operative to examine models, while the reading of voluminous specifications might be a hopeless task.

Patentees in the States are very frequently working men, and there is no doubt that this is due to the character of the American patent laws. In England on the other hand, working men cannot afford to take out patents if they would. This is a national disadvantage in the growing competition between the two countries, but there are other reasons why workmen invent on the other side of the Atlantic and do not here. The traditions of the workshop in England are not favourable to improvements. Our artizan objects to cheapening work, and resists rather than promotes the adoption of labour-saving appliances. He fears "making work scarce," and thinks the more a job costs and the longer it lasts the better for him. He has never been encouraged by the hope of reward to scheme new means for expediting work, and it is equally against the principles of his order and the rules of his Trade Union to do so.

Shop traditions in America are of a totally different kind. The workman sees that cheap production means increased demand, and does not treat every job of work as if there were no other to follow it. Any improvement he may suggest in tools or processes is considered by the employer, and if adopted paid for. Trades

Union rules are not restrictive, and it is the custom of his class to be perpetually scheming. The patent laws as we have seen, are conceived in his interest, and he takes advantage of them whenever he hits upon anything that seems worth securing.

At the present moment we are divided between admiration and alarm at the mechanical skill of the States, and deplore the growing insecurity of our position as American competition makes itself felt in one branch of manufacture after another. Our fears indeed exaggerate the inventive powers of our Transatlantic cousins, who are certainly not superior to ourselves in originality, though being greater users, they are greater improvers of all mechanical appliances. Unless we can not only cheapen the cost of patents, but change the traditions of our workshops, it is to be feared that America may in future oust us out of one industry after another, for we are badly handicapped in the race. Patent law amendment has been talked of for years in England, but will not be accomplished until the public are alarmed on the subject. Neither will the artizan become, as he might do, an ally in our competitive battle with the States, until the employer recognizes the value of his co-operation, and encourages invention in the workshop by every means in his power.

I searched the booksellers' shops of New York without success for a compendious geological handbook

for England, Geikie for Scotland, and Hull for Ireland. The publishers said that nothing of the kind existed or was demanded by the public, and referred me to the voluminous reports of the United States Geological Survey, which though excellent, did not meet my case.

The absence of such a book is only one among many indications of the neglect with which science is generally treated in America. There are many able scientists and original workers in the States, as the names of Agassiz, Dana, Draper, Marsh, Cook, Whitney, and King sufficiently prove, and science is taught in the universities, colleges, and schools of America; but there is little popular appreciation of natural knowledge for its own sake. Nowhere are men readier to apply scientific knowledge to practical and profitable uses, but the interest seems to cease with the application, and so far as pure science is concerned, the great majority of Americans are Gallios.

The Smithsonian Institution at Washington, endowed by James Smithson, an Englishman, "for the increase and diffusion of knowledge among men," is to some extent a case in point. It has an excellent reputation in Europe for the liberal and enlightened way in which it endeavours to carry out its founder's cosmopolitan intentions, by printing and distributing scientific works. Yet, saving a valuable and excellently arranged ethnographic collection, deposited there *en bloc* by the United States Geological Survey, its museum is

neither valuable nor well arranged, being indeed little better than an old curiosity shop, rarely visited except by travellers like ourselves, or by negroes at holiday times.

A different state of things prevails in the neighbouring "Department of Agriculture," whose scientific activity however does not disprove what has been said above. Agriculture is usually conducted by the rule of thumb; yet the growth of plants and animals depends on biological laws requiring the nicest research for their elucidation. The systematic experiments of Messrs. Gilbert and Lawes are perhaps the only important efforts which have yet been made in England towards applying the methods of science to agricultural questions. In Germany on the other hand obscure and difficult problems of biology are being vigorously attacked on behalf of agriculture, and America, if a Gallio in science, has a single eye for everything that fosters business. Farming is one of her chief industries, and on its behalf Congress has taken the unusual course of subsidizing a department for the examination of all agricultural questions of national importance. A research on the growth of "sorghum," the Chinese sugar-cane, is now in progress at Washington, whose results promise to be of immense importance in states where the climate is too cold for the cultivation of the ordinary sugar-cane; and a laborious analytical examination into the relative feeding values of all the grasses of America is also in

hand. The Department of Agriculture is an institution we should do well to copy. It is directing inquiry into the fundamental principles of growth both in plants and animals, and laying down new lines, much needed in England just now, for the guidance of the farmer.

The Potomac is a wide shallow stream, with low, well-wooded banks of drift, and abundantly stocked with shad, an excellent fish which is taken on a very large scale a few miles below Washington. A trip to see the nets hauled, with a fish dinner to follow, is one of the amusements of the city, and a "shad bake," or "plank shad excursion," was always a favourite form of picnic in old Southern days. It was a stifling morning when we left the city with a party of perhaps a hundred people, in a large river steamer. The Potomac was gay with shipping of all kinds, from brigs in cargo for Washington, to fishing crafts and pleasure yachts. The latter are more like saucers than boats. Each carries a single mast, stepped near the bow, and one great mainsail, with a boom nearly twice the length of the yacht. They are exquisitely built, and sail like the wind. The river near Washington is full of shallows, covered with miles of stake nets, in which great quantities of Potomac herrings are taken at every tide. Fifteen miles below the city is Mount Vernon, the burial-place of George Washington, on passing which the steamer's bell tolled solemnly, and shortly afterwards we reached the fishery.

Shad are taken in seines not less than three miles long, which are hauled twice in every twenty-four hours by a steam-engine and windlass fixed on shore, the tackle being quite unmanageable by hand. When the net reaches shallow water it is surrounded by a semi-circle of black fellows who, standing close together and waist-deep in the water, keep up a constant stamping to frighten the fish and prevent their escaping. Meanwhile large "scows," or flat-bottomed boats, are brought alongside the seine and filled with shad by means of wooden scoops. When loaded, these are taken in tow by a steam-tug, and the fish are landed in Washington market within an hour or two of being caught. The seines are shot from a large boat propelled by forty rowers, or in the case of some companies, by a steamer. These long nets cost £1000 each, and the whole plant of a shad fishery is worth nearly £2000.

When the scows had been loaded we landed by a rickety stage and found dinner awaiting us in a big wooden shanty on the bank. This primitive hotel stood among maples and hemlocks growing thickly around, but hardly shading it from the sun, which beat fiercely down although it was yet early in May. Within, everything was clean, but rough, the tables made of sawn boards, no tablecloths, and chairs of the simplest structure. Negro waiters ran to and fro with plates of baked shad and great jugs of coffee. No one drank any intoxicating liquor, although the shanty seemed red-hot,

and we, dripping like sponges, were quite ready for a cool "cocktail." Outside the shed, a wood fire about a foot in width and nearly twenty feet long was blazing. This was bordered on either side by a wide plank set edgewise in the ground with its face to the fire. The freshly caught fish were nailed to the planks and after ten minutes' roasting served, only a little hotter, judging from appearances, than the black cooks who tended them. Shad, shad roe, and coffee, all hot, brought us rapidly near the fusing point, and having satisfied hunger, we beat a quick retreat from the wooden oven to the deck of the steamer, seeking air. But the morning breeze had died away, and sweltering under the pitiless sun we began to understand what summer in the sunny South must be like.

Washington looks imposing when approached from the river. Its granite and marble buildings glitter in the brilliant sunshine, while an atmosphere clear as that of Italy makes distance seem of no account. The dome of the Capitol—a more striking object than the cupola of St. Peter's itself—towers above all the other piles, and when sunset tinges with rose the pure whites and greys of marble and granite, it must be admitted that there are few fairer cities than that of the "magnificent distances."

CHAPTER IV.

PHILADELPHIA.

May 10–15.

WHEN Charles II., richer in American land than English gold, gave a province to William Penn in liquidation of a claim for money lent by his father to the king; he set up a rival monarch, the "Quaker King," as his settlers liked to call him, in whose capital a century later kingly power received a deadlier blow than that which struck the "Martyr" on the scaffold in Whitehall.

"My province" said Penn on landing, "is a free colony for all mankind, and its people shall be governed by laws of their own making." These were strange words in an English mouth at the end of the seventeenth century, as they would be in some European countries to-day, but they were pregnant with freedom.

Penn's forest capital was a hamlet of three or four cottages scattered in clearings among the pines in 1681; it is a city of nearly a million inhabitants to-day. He called it "Brotherly Love" (Philadelphia) and by the "divine right" of love and justice alone did the Quaker

king rule the settler and the savage. Expelled from the University of Oxford for attending meetings of Quakers, exiled by a king too divine to pay his debts, Penn left this country to found a city where the principles of government which he proclaimed to an obscure group of colonists were afterwards to be affirmed in the Declaration of American Independence, and adopted as the basis of national life by what is now the freest, if not the greatest people in the world. If kings possessed divine insight, and learned bodies had saving knowledge, Charles II. would never have let William Penn, the Christian statesman, loose on the world. Better for king and priest to have kept him pining moneyless in gaol; but happy for mankind that he had the courage to accept the distant patch of primitive forest, and faith in the power of liberty to reclaim and govern it.

The most interesting object in all the United States is "Independence Hall," the old "State House" of Philadelphia. It is the cradle of American liberty; the first meeting-place of the "Continental Congress;" the spot where Adams, Jefferson, Franklin, Sherman, and Livingston, a committee of the Congress, drew up the Declaration of Independence, and whence the "bell of liberty" proclaimed the birth of free America.

This modest building, which reminds the English visitor of an old-fashioned town hall, was built in 1735 as a permanent place of meeting for the assembly of Pennsylvania which had hitherto managed the affairs of

the colony from all sorts of temporary abodes. Here the newly formed Congress met for the first time in 1775, removing as we know to Washington in 1800. The hall is now used as a court-house and for municipal purposes, but it is also a national museum, containing a collection of historical relics both of the colonial and revolutionary periods. Among the former are Penn's original charter of the city of Philadelphia and a painting of himself negotiating with the Indians. The later time is illustrated by a copy of the Declaration of Independence,* and portraits both of its signers, and the soldiers who distinguished themselves in the war. These were painted by an Englishman named Sharples, and are excellent works of art. The English type of face prevails in them to a remarkable extent, the characteristic American features of the present day having evidently not yet arisen. The pictures hang round a chamber called the "Congress Hall," preserved in exactly the same state as when the Declaration was signed within its walls; and in a corner of the room is the old "liberty bell"—cracked, and replaced in the belfry by a fac-simile—whose tongue first told that America was free. It bears an inscription very characteristic of the fine old colonists who hung it in their State House tower: "Proclaim liberty throughout the land to all the inhabitants thereof."

* The original is carefully preserved at Washington, and it is much to be regretted that lapse of time is destroying the ink with which it was written.

It is an impressive sight, this modest but dignified chamber, with its familiar eighteenth-century furniture and its intensely old-fashioned English air. The faces which look out from the walls are like those of our grandfathers, and belong without exception to earnest and capable men who are fully conscious of their responsibility and the importance of the matter in hand. Dr. Franklin's portrait shines with his cheerful wit. It is easy to believe that he looked thus when prudent John Hancock, who headed the members of Congress coming up to sign, said, pen in hand, "We must be unanimous, gentlemen; there must be no pulling different ways. We must all hang together." "Yes," said Franklin, "we must all hang together, or else we shall all hang separately." They laughed at the sally; but there were anxious hearts among those who laughed. It is pleasant to see with what enthusiasm Americans regard these germs of their national life, while, far removed as we are from the policy of that day, it is also pleasant for English visitors to be reminded that the brave men who planned and bled for American freedom were so conspicuously Englishmen.

Philadelphia is larger than any other city in the Union, and its paved streets measure three hundred and fifty miles. It is second to New York in population, but first in manufactures, surpassing the capital in the amount of money invested and number of hands employed in its factories.

American cities are laid out in square blocks like a chess-board, but happy irregularities sometimes occur, as in the case of Broadway which cuts diagonally across New York; and at Washington, whose streets are partly radial, partly rectangular—"the city of Philadelphia griddled across the city of Versailles." The town of Brotherly Love on the other hand is quite "on the square," as might be expected in a Quaker city, and it consequently illustrates perfectly the American science of numbering houses. The city lies like a great chequer-board between the Delaware and Schulkill rivers, whose courses are roughly parallel at this point. The divisions between the chequers coincide with the cardinal points of the compass, and all the streets running north and south are numbered consecutively from 1 to 30, beginning at the Delaware. These are crossed at right angles by named streets, the houses of which are numbered from east to west, all between First and Second Streets being between 100 and 200, and all between Second and Third Streets between 200 and 300, and so on; so that the number of each house indicates the number of the street in which it is situated as well. Thus, if the number of a house is 836, Eighth Street is east and Ninth Street west of it. In like manner streets running north and south are allowed 100 numbers for every square they are distant from the central, or Market Street, either north or south. In going about the city therefore, whenever one can see a number he

can calculate his exact distance from Market Street or the Delaware. This is scientific but prosaic. An Englishman would not like to have such an address as "No. 1710, Eighteenth Street;" while to be identifiable by a number has something of the convict about it.

The "Continental" at Philadelphia may stand for a portrait of American hotels generally, in describing which it is necessary to make comparisons more or less "odorous." An English hotel is a place to eat, drink, sleep, and be cheated; where the maximum of electro-plate is combined with the minimum of mutton cutlets; where wine, ice, and baths are ruinous luxuries; where bedrooms are cleaned before the arrival of guests, but not during their stay; where the waiters, to say the best, think more of their tips than your comfort;—a place which the traveller enters leaving hope behind, and leaves, but for his bill, with pleasure. The guest of an American hotel on the other hand pays a fixed tariff of from twelve to sixteen shillings a day and there are no extras. He is lodged in a bedroom, often with a sitting-room and always with bath and retiring rooms attached, which are kept scrupulously clean. Four meals almost overlapping each other in time are served daily, and one may therefore feed at any hour. I have counted eighty-two dishes on a dinner *menu*, any or all of which may be ordered at discretion. Ice is a drug both at table and in the bedrooms; no one drinks wine, so there is no temptation to order any-

thing simply "for the good of the house." Practical lifts, which *really* abolish the staircases, are running all day, and can be called from any floor by an electric bell. The waiters are independent in their manners, but attentive to orders and require no "tips." The bar dispenses Olympian nectars. The hall is an exchange, telegraph, and telephone office, railway booking office, and mart, where every want from a suit of clothes to a cigar may be bought. The hotel "clerk" is an official having no equivalent in England. He is an equal with whom if you are wise you will shake hands on arrival and leaving. There is no local information which he cannot give you, and he furnishes it with a frank pleasure in being of use that is delightful. Some of these great houses can accommodate more than a thousand guests and cost as much as three-quarters of a million sterling to build and equip. Yet, in spite of their size and complication they are "run" with the smoothness of a private house. The order and cleanliness is perfect, the service far better than ours, and every *employé* is kept up to the mark by vigilant heads of departments who are felt but not seen.

The janitor of the Academy of Natural Sciences looked quite surprised to see a visitor, and I paced the spacious galleries of this home of knowledge quite alone. Natural science is not more popular in Philadelphia than at Washington, though here, as there, it receives the homage of fine buildings. Material

success is confessedly the leading pursuit in America, but it is followed with so much intelligence that it is difficult to believe the Americans are not an intellectual nation. Gradually however one learns that the breadth of view and readiness to entertain new ideas so delightful to a new-comer are strictly confined to business, to which if science does not minister it is neglected.

In a less degree the same thing is true of art. Philadelphia possesses a fine Academy of Arts, with charming picture galleries, consisting of a group of large central halls having side rooms opening into them, so that there is a general view of the saloons from every point, giving the visitor a delightful sense of lightness and freedom. The schools too are excellently designed, but the amount of art work going forward within these walls is surprisingly small for so great a city. I counted from thirty to forty students where I expected to find hundreds.

No one who looks critically at the toilettes of Fifth Avenue, or at Tiffany's exquisite silversmith's work and jewellery, can deny that the Americans have excellent taste; and probably no European capital contains finer private galleries of modern pictures than New York. But it cannot be said that the cultivation of art any more than of science is characteristic of the American people. This is probably only a transition state of things. Americans who have resided, been educated, or had frequent communication with Europe, cultivate the Muses assiduously; and from this union of Old

World culture with New World freedom there has arisen a charming social life in many of the Atlantic cities. But these coteries are the leaven, and we are talking of the lump.

The old Pennsylvania Hospital, built in 1750, is another relic of the colonial age which is extremely English in character. The building is worth a visit on this account, but it also furnishes a capital example of the application of scientific principles to practical wants. Warming and ventilation were not much considered in the construction of eighteenth-century buildings; but the American medical man characteristically likes to use the best appliances for his work and has no notion of making a bad job for want of good tools. In accordance with modern ideas he has consequently introduced a system for supplying the wards of the old hospital with fresh air in any required volume and at any required temperature. A large fan, driven by steam-power, draws atmospheric air from a pure source and drives it through a chamber furnished with coils of hot-water pipes whose temperature is regulable at will. The pure air thus dried and warmed is introduced into the wards at the floor level, whence it flows through gratings in the ceiling into tall chimney shafts. There are no fires, no open windows, and no draughts, and pyæmia, the curse of ill-ventilated hospitals, is unknown.

In view of the advanced character of such arrangements it seems paradoxical that medical education in

the States is so perfunctory, and that medical degrees should be obtainable with almost scandalous ease. A medical student in England cannot obtain his M.D. in less than seven or eight years, during a large portion of which time he is employed on clinical work. In America on the other hand a student can take his degree within at most three years, during which time his attention has been wholly given to book-work; so that it is actually possible for a medical man to commence practising before he has felt a pulse or taken a temperature. I do not say this occurs, but only that it can happen.

Each state has its own degree-giving bodies, often constituted, especially in sparsely peopled states, by not very enlightened legislatures; and in certain parts of the Union degrees may consequently be obtained by men without any real knowledge, and in almost any school, whether of medicine or quackery. The public sentiment of America is so jealous of any interference with freedom of opinion that it resolutely objects to selecting any one system of medicine in which to grant degrees. The title of "Dr." consequently gives no guarantee that the holder is an educated man; and a crowd of unscrupulous quacks, many of them indisputable doctors, infest the States to an extent which is unknown in any other country. As the properly qualified members of the profession advertise their names and official addresses—every doctor in the States

has an *office*—the quack cannot be distinguished from the educated practitioner by the use of so general a custom, and he flourishes in proportion to his skill as an advertiser. Quack advertising is a gigantic institution in America, and the quantity of patented medicines manufactured is almost incredible. Some of these remedies are produced in great factories, and fabulous fortunes are made by their proprietors. It may be said that the demand for nostrums creates the supply; but American quackery is fostered to such an extraordinary degree by the promiscuous granting of medical degrees that it is more than time some centralized system should be established which, favouring no school of medicine, should at least require a competent knowledge of the structure and functions of the human body from every American M.D.

Chestnut Street is the fashionable promenade and contains all the best hotels, offices, and shops. Here may be seen two more fragments of Old England: "Penn's Cottage," the first brick house built in Pennsylvania for William Penn; and the old "London Coffee-House," now a tobacco shop, another brick house, built in 1702, and frequented by the city magnates in the colonial days. The residential streets of Philadelphia are embellished with handsome houses of brown stone and white marble, but there are few gardens. Roads and pavements, as usual elsewhere, are disgraceful, thanks to the absence of municipal public spirit, but nothing

can exceed the order and cleanliness of the homes of the well-to-do classes. Housekeeping in the Atlantic cities is carried on with the thoroughness of business, and not in the sloppy way too common at home. Whatever may be the faults of American "helps," they are not visible to foreigners, and are more than compensated for by good management on the part of mistresses. A good many laborious and dirty operations are certainly saved in American houses by the use of mechanical arrangements, especially in regard to warming and the disposal of waste water, but the credit of excellently well-kept houses belongs to the housekeeper nevertheless.

The Philadelphians differ essentially in character from the New Yorkers. The latter are cosmopolitan, speculative, and easy of approach. The former are provincial, prudent, and exclusive. The two cities are great rivals; and while New York boasts its larger population, its greater commercial activity, and its social splendour, Philadelphia prides herself on her more important industries, her commercial solidity, and social propriety. New York thinks itself brilliant, and Philadelphia slow. Philadelphia on the other hand considers herself safe, and New York speculative. Perhaps an Englishman's training disposes him to lean to the Quaker rather than the cosmopolitan view.

CHAPTER V.

THE COAL-FIELD OF PENNSYLVANIA.

Mauch-Chunk, May 16–19.

ALL the eastern cities are built on the "Atlantic slope," which is a low plain bordering the Atlantic coast and having a width of from fifty to a hundred miles. Beyond this rise the Alleghanies which are not so much a chain of mountains as a plateau crested by several chains, separated from each other by elevated valleys. East of the Hudson river the hills form irregular groups, but in Pennsylvania they become long, parallel ridges, varying from two thousand five hundred to four thousand feet in height, with a total breadth of a hundred miles.

The subterranean floor of the Alleghanies is composed of Primary rocks which, in a much earlier stage of the world's history, formed a great range of mountains probably higher than the Andes. Under the influence of rain and frost the *débris* of these easily weathered felspathic rocks accumulated in the neighbouring ocean where they formed the Palæozoic strata constituting the present Alleghany chain. While the old mountain range was thus being slowly destroyed, the sea which

received its *débris* was gradually deepening, and so continued through periods of such vast duration that the sedimentary beds derived from the ruins of the Primary rocks were piled up to a thickness of nearly seven miles. At length the ocean ceased to deepen, and the period of deposition closed with the Coal-measures, which constitute a subordinate system in the vast and varied Palæozoic succession. These stratified rocks were next subjected to enormous lateral pressure, produced probably by the falling inward of the earth's crust, which must have repeatedly occurred as the internal mass shrank on cooling; and resulting in the formation of great folds, or crumples, such as are made by laterally squeezing the leaves of a book. The greater part of the ridges thus produced have since been planed down by denudation, but their original height is indicated by the curves which remain, while the depth of the corresponding troughs is similarly inferred. The present plateau of the Alleghanies is only a small fragment of these great convolutions, and the greater part of the once continuous Coal-measures have been swept away, only those escaping which lie in the deep troughs, or "synclinals."

The Pennsylvania coal-field consists of three such synclinals, lying in three narrow parallel glens, known as the Schulkill, the Mahoning, and the Wyoming valleys, stretching westward right across the state. The original area of the Pennsylvania coal-field cannot be defined, so

much of it having been destroyed by erosion, but it probably extended to the Catskills and Southern New York, and might have been continuous with the coal of Rhode Island, New Brunswick, and even Nova Scotia; while it certainly spread westward in an unbroken sheet across the state of Ohio and joined the fields of Indiana and Illinois.

West of the Alleghanies the coal is bituminous, while east of them it is anthracitic in character. There is a regular progression in this respect from west to east, the coal passing by almost insensible degrees from its most gaseous to its dryest condition, and this change coincides with the more or less disturbed state of the Coal-measures themselves. Among the crumpled ridges of the mountain range the beds are upturned at high angles, covered by disturbed strata, and exhibit frequent outcrops; while westward of the hills they are almost flat and the overlying rocks are undisturbed. The position in the former case is favourable to the gradual escape of the hydrogen once contained in the coal, while in the latter instance the gas has been retained. To this circumstance the Atlantic cities owe their freedom from smoke. New York and Philadelphia have the bright atmosphere of Paris, but manufacturing towns west of the Alleghanies are as dingy as any in England.

The little town of Mauch-Chunk, built on the river Lehigh, an affluent of the Delaware, lies in the very heart

of the Pennsylvania coal region, and possesses a special interest as the cradle of the American coal trade, while the Lehigh Valley itself is called the Switzerland of America. About the middle of the eighteenth century a hunter trapping over its wilds built his camp fire on "Summit" Hill upon half a dozen big stones, which to his great astonishment took fire and burnt like logs. In the course of time the story reached Philadelphia and excited the attention of some of the enterprising citizens, who ultimately chartered the Lehigh Coal-Mining Company in 1792, and commenced to work this strangely discovered coal-field. Companies were modest bodies in those days, and this one began by authorizing an expenditure of £5 for making a road from the outcrop on Summit Hill to the foot of Mauch-Chunk, or Bear Mountain, the nearest point on the Lehigh. This river is a shallow stream with a number of rocky ridges extending almost across the stream and giving rise to many rapids. Nothing could look less promising for navigation than the Lehigh in dry weather, but the Quakers were sturdy men, and fuel was already a want in Philadelphia. The coal was carted to the river by mules and shipped in great flat-bottomed scows of very light draught, and these, when there was water enough, ran the gauntlet of rocks and rapids for forty miles at which point the Lehigh joins the navigable Delaware. In the course of a short time the bed of the river was paved with the wrecks of the scows, but very

little coal reached Philadelphia, and after much labour and disaster the attempt was abandoned as useless and the enterprise slept for nearly thirty years.

In 1818 a new survey was made of the Lehigh, and it was improved for navigation. Two years later another company, called "The Lehigh Navigation Company," was formed, and the two corporations having amalgamated, the first cargo of coal reached Philadelphia in 1820. It was three hundred and sixty tons in weight and stocked the market for a year! Five years later the prospects of the trade had improved so much that a canal from Mauch-Chunk to White Haven on the Delaware was projected and opened in 1829. After being many times nearly destroyed by floods, this work was almost ruined in 1862, when the Lehigh Valley Railway was built to replace it and the canal abandoned. Simultaneously with the cutting of the canal, a railroad, the first in Pennsylvania and second in the States, was constructed from Summit Hill to Mauch-Chunk. In the beginning this was simply a grade some nine miles long, falling gently from Summit around the hillsides to the level of the river; but the outcrop, which alone had hitherto been worked, became inadequate to supply the increased demand, and the seam was accordingly followed into the valley on the other side of the hill where fresh pits were opened. The Gravity Road was improved and extended to the new workings, powerful winding engines were substituted for the mules which

had hitherto hauled the empty trucks up from the wharves to Summit, and the whole system brought into a condition of efficiency which reflects the utmost credit on the men who carried out the work at a time when the principles of railway construction were little understood. It is said that one of the chief mechanics employed was sent to England on one occasion for the purpose of learning some trifling details of rail-laying. He returned with only part of the required information, having omitted to make any notes, and his memory failing him in one important particular. Notwithstanding the length of the voyage he was sent back again for the missing link, and the incident proves the earnestness with which a new and difficult enterprise was attacked.

The Lehigh Valley Railway has long since superseded the Gravity Road, and Summit Hill has been pierced by a great tunnel, through which the coal from all the numerous pits finds its way to the rails; but the old route remains intact and is used every summer as a pleasure road by tourists. From the top of its highest inclines magnificent views are obtained of a country very much like the Jura, while the descent by gentle grades to Mauch-Chunk along hillsides densely clothed with primitive forest of chestnut and oak, with an undergrowth of rhododendron and azalea, forms not the least charming part of the trip.

We have seen that sixty years ago a shipment of

three hundred and sixty tons of coal glutted the Philadelphia market. Ten years later two other coal-fields besides that of Lehigh had been opened in the Schulkill and Wyoming valleys respectively, and the production had advanced to 170,000 tons. Within another ten years the Shamokin coal measures were tapped, and 800,000 tons marketed ; while ten years ago, the coal raised in Pennsylvania amounted to nearly 24,000,000 tons—about one-fourth of the whole out-put of England, and the industry gave employment to thirty thousand people. A second railway—the Central of New Jersey—now runs through the Lehigh Valley, which is hardly wide enough to contain the street, the river, the canal, and the rails. The Mauch-Chunk hotel flanks the railroad closely, and the visitor is soon made aware that the Switzerland of America is no quiet solitude. From the "Mansion House" he either sees or hears trains of a hundred and fifty cars each following within sight of one another in a continuous stream all day and night. The engines toll a huge bell as they pass through the village and their whistles emit a thrilling bass note, while the automatic brakes are operated by a steam aspirator whose penetrating hiss is worse than the whistle. Such are the accompaniments of romantic scenery in the Switzerland of America.

Coal-mining is conducted quite differently in England and in the Alleghanies. The seams with us are rarely more than a few feet in thickness, and, though

often much disturbed, are not far from horizontal. The anthracites of Pennsylvania, on the other hand, are fifty and sometimes even eighty feet thick, and lie in highly inclined beds. The bituminous coals west of the Alleghanies are thinner and nearly level. The latter are consequently worked by shafts, as with us, but the steep and thick seams of the former district are usually reached by horizontal tunnels pierced in the hillsides, and the coal is quarried rather than mined. The chief ironworks of the States are collected in the Lehigh and neighbouring valleys, and the first furnace ever erected in the States for smelting iron with anthracite coal was built at Mauch-Chunk itself, that "happy father of twins"—the coal and iron trades of America.

CHAPTER VI.

ACROSS THE ALLEGHANIES.

Huntingdon and Altoona, May 20–24.

THE traveller designing to go west from the Pennsylvania coal-field by the Pennsylvania Railway, returns from his short excursion into the eastern valleys of the Alleghanies to the Atlantic slope, and turning his face south, skirts the feet of the mountains until he reaches the Susquehanna at Harrisburg.

The country between Mauch-Chunk and Harrisburg is some of the oldest settled land in Pennsylvania, and looks like a smiling agricultural district in England. The farms, cultivated by their owners, are seldom more and sometimes much less than a hundred and sixty acres in extent. Near market towns they are worth as much as £50, but in the country they sell for £10 an acre. Numerous villages, pretty farmhouses, cleared fields, small enclosures, good fences, and capital crops, chiefly of artificial grasses, remind the tourist of Europe rather than America. The first contact with such small farms is a surprise to Englishmen who usually

but erroneously suppose that farming is always conducted on a very large scale in the States.

After crossing the Susquehanna on a long bridge, light as a cobweb in appearance, the train follows the valley of the Juniata for more than fifty miles into the heart of the Alleghanies. The hills are generally not more than a thousand feet in height; they are wooded to their summits, and intersected by numerous valleys carrying unimportant streams. The banks of the Juniata are thickly clothed with sumach and acacia, the latter filling the air with a delightful fragrance.

If, warned by the din of the American Switzerland, and mindful that his next resting-place is the home of the great workshops of the Pennsylvania Railway, the traveller elects to woo sleep in some quiet retreat on the way, he is not unlikely to spend a night in the agricultural village of Huntingdon. In that case, he finds himself on stepping out of the cars in the main street of the place, there being no platform, and the "depôt" only a neighbouring shop for the sale of tickets; while the railway, one of the greatest arteries of commerce in America, is flanked on either hand by the hotels, shops, and dwelling-houses of the village. A constant stream of traffic pours along the line, passenger and emigrant trains during the day, corn and coal trains both night and day. The big bell and deep toned whistle are seldom silent, but the villagers seem to like it. They loaf into the bar in the morning, a

mixture of master mechanic and labourer in appearance, and read the paper, or take their "whisky straight." At night they sit in groups on the side-walks bordering the rails, with heels up, chatting, chewing, and spitting. At the corner near the depôt is a telegraph office, the main street is lined with wires, half a dozen of which enter each of the two village "hotels," and the click of the sounder can be heard whenever the trains are silent. The side streets, laid out as usual on the square and planted with acacias, are a mass of ruts and holes as to the roadway, while the side-walks consist of planks, badly fastened, and often with loose ends. The "cottages" are boarded houses, roofed with shingles; there are no gardens, and the women spend the hot evenings seeking air on their door-steps, nicely dressed, with their hair carefully, not to say fashionably, arranged. Sometimes from an open window the notes of an American organ float out into the warm still air, heavy with the scent of acacia blooms. Here and there an ugly chapel breaks the monotony of the street, or a square brick church with an open-work cast-iron spire, accentuates the surrounding prose. From a picturesque point of view pastoral Huntingdon is a failure, but these sincerely unromantic people cannot see it. They are serenely sure that it is all right, and would think it superior to the prettiest English village.

Such places as Huntingdon, even more than New

York City or Philadelphia, illustrate the fundamental differences between national character in America and England. The rural life of the two countries is as far as the poles asunder, both in outward semblance and inward spirit. The English hall and squire, the old church and parson, the village green, the thatched cottages, the patient people, and simple costumes, form a strange contrast to the hotel, the wooden chapel, the railway and telegraph, the board houses and "high-toned," well-clad people of Huntingdon; but this is nothing to the gulf which separates the mind of the English rustic, with an ambition too often bounded by parish relief, from that of the American "hired man," who alternates between working for others at high wages during the busier agricultural seasons and tilling his own acres in the intervals.

Altoona lies at the very foot of the highest and most westerly ridge of the Alleghanies. It is a city of fifteen thousand inhabitants, built since 1850, when the site, then primitive forest, was chosen for the erection of the vast machine-shops of the Pennsylvania Railroad. These works are the only interesting feature of Altoona, which is another Huntingdon in appearance. They are well situated for supplies of coal and iron, laid out on an enormous scale, and fitted with everything that engineering science can suggest for improving and expediting work. Hence the locomotives and rolling stock of the Pennsylvania Railway Company, all of

which are built within these walls, are unsurpassed in excellence of workmanship.

The hotel at Altoona abuts on the railway, whose four lines of way are constantly roaring with traffic. The Medical Association of Pennsylvania was holding its annual meeting here on the day of our visit, and a kind of open-air *conversazione* took place in the evening after the reading of papers was over. The scene, though interesting, was not a little incongruous to English eyes. A large number of ladies and gentlemen, all *en grande tenue*, lounged, sat, or strolled, chatted with old friends or made new, on the verandah of the hotel, which occupied exactly the same position in regard to the railroad as the platform of a station does with us. Meanwhile travellers embarked and disembarked, great walls of trunks were made and unmade in the midst of the conversationalists, great trains of coal, corn, and emigrants roared through the echoing dêpot, bells tolling and whistles blowing. Across the way the clanking workshops added to the din, while to crown all, a terrific thunderstorm burst over this Pandemonium. But society was not stirred in the least. It made polite speeches, smiled, and flirted happily, and seemed entirely unaware of any incongruity in its surroundings.

This little *réunion* of ladies and gentlemen, few of whom were intimates, offered us many opportunities of observing that gallantry towards women for which America is famous. Women in the States are surrounded

with privileges unknown in the Old World. They can appear alone anywhere and at any time. They may travel from the Atlantic to the Pacific coast without an escort. They may claim as a right attentions which are only accorded as a favour in Europe. With a touch of her fan or parasol, a lady may indicate to a perfect stranger that she desires his seat in a concert-room or an omnibus. When this is yielded she may take it without thanks. Or she may load her male companion with trifles without paying for his service with a smile. All this might be called chivalrous but for the curiously common place air which it assumes. The charm of small cares lies in their being rendered as much to please the giver as the receiver. But a pretty girl in America sends a young man on her errands in so business-like a manner, that she looks selfish and he a little silly.

The ascent of the Alleghanies begins just beyond Altoona. The grades are not severe, and two magnificent locomotives carry the train easily and quickly up to the summit, a distance of eleven miles. Here, at three thousand feet of elevation, the astonished traveller finds iron furnaces in blast and extensive coke hearths blazing. A few miles further on all traces of coal and iron industries disappear, and a comfortable hotel presents itself at Cresson Springs, where it is extremely refreshing to spend twenty-four hours in the cool bracing air of the summit, before descending into

the heat and smoke of Pittsburg. The watershed of the Alleghanies is a wide plateau, densely covered with forests of oak, maple, pine, and hemlock, diversified with numerous cleared farms and land in the course of clearing. The crops grown at this elevation are chiefly oats and artificial grasses, but wheat will ripen. Uncleared land is worth from five to ten dollars an acre, and clearing costs about ten dollars an acre more. The trees are felled at about two feet from the ground, and the stumps allowed to rot —an operation which takes five years with hemlock, fifteen years with oak, and as much as fifty years with pine. Descending the western slope of the range, the railway follows the valley of the Conemaugh, falling by gentle slopes through a lovely country of densely wooded hills, furrowed by numerous side ravines. The remains of another railroad are constantly seen from the cars, sometimes above and sometimes below the track followed by the trains. This is the old "Portage Railway," which in pre-locomotive days carried loaded canal boats in sections over the hills by a series of inclined planes. On reaching the eastern base of the mountains, the sections were once more united, and the complete barge relaunched. The whole thickness of the Palæozoic strata of the Alleghanies is exposed in the railroad cutting, the beds lying in a great trough, or synclinal basin, so that they are first passed in reverse order and afterwards in the proper order of superposition.

As the train traverses mile after mile of this magnificent section, the mind loses itself in a vain endeavour to realize the lapse of time during which the vast pile of sediments was built up. Equally in vain it tries to picture the forces which subsequently crumpled the mass, seven miles in thickness, into gigantic folds; and lastly, but still vainly, it asks how long since rain and frost began to pare down the Andean ridges to the small fraction of their original mass which constitutes the present Alleghany chain.

CHAPTER VII.

PITTSBURG.

May 25–27.

THE English colonies of America in the middle of the eighteenth century were confined to a strip of land lying along the Atlantic coast. The French who had explored the great lakes, the Illinois, Ohio, and Mississippi rivers, establishing trading posts, forts, and missions on their way, claimed all the interior regions from the St. Lawrence to the Gulf of Mexico, and were quite as anxious as the aborigines with whom they traded to keep the English out of all that region. Our colonists indeed began to feel so hemmed in that the Governor of New York wrote to England saying that if the French were allowed to hold all they had discovered, England would not have a hundred miles from the sea anywhere. It was under these circumstances that George Washington was sent, in 1753, to remonstrate with the French officers who objected to the English making a survey of the Ohio Valley. The mission came to nothing, but Washington on his way home selected a spot at the confluence

of the Alleghany and Monongahela rivers for the erection of an English fort. The Virginian Government approved of his project and sent an expedition to carry it out, whereupon the builders were attacked and driven away by the French, who finished the work themselves and called it Fort Du Quesne. In the summer of 1755, General Braddock with a veteran English army tried to retake the post, but his ignorance of Indian warfare caused him to suffer a crushing and bloody defeat. This repulse gave rise to the greatest excitement.throughout the colonies and in England, while it left the French in possession of all the country west of the Alleghany Mountains. Three years later however Fort Du Quesne surrendered to Washington, and its capture was one of the most important incidents in the French and Indian war of 1755–63, which ending unfavourably for France and her savage allies, determined the question whether the French or the English should control the continent of America. It is worthy of remark that the same question was answered with regard to India in the same year, and in the same way; for with the disgrace of the great Dupleix, in 1754, began the fall of French power, and with the recall of his almost equally great lieutenant Bussy, in 1758, passed away the last chance of French supremacy in India.

On the site of Fort Du Quesne now stands the manufacturing town of Pittsburg, looking down upon

whose busy streets we cannot but wonder what would have been the effect on America if a different result had attended the international colonial struggles of the eighteenth century. The Monongahela and Alleghany rivers, flowing one north and the other south, drain the western slopes of the Alleghanies for a distance of three hundred miles and finally unite to form the Ohio. At their point of junction they have thrown up a delta upon which Pittsburg is built; and as both rivers run through steep bluffs of carboniferous strata, the town is hemmed in by rocky walls. The city has outgrown the delta and thrown one offshoot called Alleghany City across the river of that name, and another called Birmingham across the Monongahela. All the flat land is covered, and still there is not room enough for the private residences of merchants and manufacturers, which have been obliged to spread over the top of the neighbouring bluff, whose steep sides are scaled by several steam inclines. The view of Pittsburg from above on a still day is like "hell with the lid off," the whole city being covered with an opaque pall of black smoke, lurid here and there with the flames that issue from the chimneys of rolling-mills. Iron and glass-making are the chief industries, but a large amount of miscellaneous engineering work is also carried on. The Alleghany and Monongahela flow through inexhaustible coal and iron fields, while the Ohio, which is navigable to its junction with the Mississippi at St. Louis, forms an

open road to the Gulf. Pittsburg accordingly supplied the Southern states with coal, iron, and manufactures in their palmy days, before water carriage was supplemented by railroads; and since these were introduced the city has become the centre of a new and extensive trade with the growing Western states.

"The stranger," says the guide-book, "will have missed the city's most characteristic sights if he fails to visit some of its great manufacturing establishments;" which is perfectly true in more than one sense of the words. America is at once the most economical and lavish of nations—lavish of her natural resources, but economical to the last degree of labour. Even in the Eastern states, where manufacture is much older than in the West, and conducted more upon European lines, waste of material occurs such as would make all the difference between profit and loss in the Old World, where competition has brought prices down to their lowest point, but which passes unnoticed in the States, where a high price is ensured by the protective tariff.

Eastern extravagance however is economy compared with western waste. The very smoke of Pittsburg tells the traveller beforehand what to look for within the walls of the great rolling mills, where, instead of a scientific use of fuel, he finds the slovenliness of Staffordshire. The American Iron Works cover seventeen acres of ground, and employ three thousand hands,

but are interesting rather on account of their extent than for their management, the quality of economic production which we associate with American industries being conspicuous by its absence. The same thing may be said of the glass-houses, which are also generally inferior to similar establishments in Germany and England, while the window glass they produce is poor in colour, and the table-ware lacks both design and finish.

But if the rolling-mills and glass-houses are open to criticism, Pittsburg offers examples of other industries, such as bridge-building for example, where labour is economized in a manner of which we know nothing in England. Indeed, we have no establishments at all similar to those in which the beautiful trussed girders of American railroads are made. The bridges for a railway line in England are designed by the civil engineer, who issues drawings and specifications to contractors for tenders, usually accepting the lowest estimate. It is seldom that a type of bridge is selected to which the various structures on the line are as far as possible conformed, and as every engineer has his own views on the subject of bridges, no two of them ever adopt similar designs. The contractor, on the other hand, is not a bridge-builder by trade; his chief business may be that of a founder, a boiler-maker, or an iron-ship builder, and he only works to the engineer's drawings and specifications. Under these circumstances, establishments fitted with a special bridge-making plant cannot arise, for

every new contract requires new preparations. Excellent work is no doubt done in this way by our civil engineers, but with a commensurate expenditure of time and money, the system excluding the use of labour-saving machinery.

In America, on the other hand, bridge-building is a specialized business, like the manufacture of watches or sewing-machines, and a visit to one of the Pittsburg bridge factories is a delightful surprise to an English engineer. An excellent building, planned for the purpose, contains all the plant and tools. Girders of many sizes are made, but all conforming to a given type of construction, and drawings, specifications, and prices of bridges of any span on this type are furnished upon application to the railway engineer, who works them into his plans, and finally orders them as he would rails or sleepers. These bridges are made almost entirely by machinery, and the pieces being accurate and interchangeable are never even put together in the work-shop, but assembled at the site of the structure. I was not surprised to hear that girders thus built can be supplied practically on receipt of order, or that large spans can be fixed in a few days.

Speciality in manufacture is an extremely characteristic American peculiarity, and next to the national habit of inventing and improving is the means by which the States have become our competitors in many mechanical industries. With us the artificer has been

and still is too much a Jack-of-all-trades, a thing which, as in the case of bridge-building, forbids the extended use of labour-saving machinery, and involves too much hand-work. Not only is this system costly, but its products are inferior in finish and uneven in quality, while it tends to increase the number of trifling and unnecessary variations in the goods produced. The American on the other hand gives his whole attention to the manufacture of a single article, trusting, even when this is a thing in small demand, to make a market by cheapening its production. With this view, he "gets up"—to use his own phrase—a machine or a series of machines, which in regard to any given manufacture perform automatically, and therefore cheaply and accurately, all the processes which the Jack-of-all-trades does by hand, turning out a better, cheaper, and more even article than his competitor, and beating him in his own market, in spite of the high prices of wages and materials in the States.

Pittsburg is a centre of the iron trade, and is surrounded by blast furnaces which, though good, are not in advance of our own. I visited the Lucy furnaces, belonging to the Messrs. Carnegie—favourable examples, as I was informed, of a modern plant—and found that their yield of iron per ton of fuel is less than with us. If ever America adopts a free-trade policy, one of its first results will be an improvement in American iron-making, for the profits of this industry are so great under the

protective system, that iron-masters are not stimulated to do their utmost in cheapening production. Nowhere is pig-iron made under more favourable circumstances than at Pittsburg, where the coal and iron are both extremely accessible, and lie side by side upon the banks of a great navigable stream, while labour is not much dearer in Pennsylvania than in Yorkshire, skilled men at the Lucy furnaces earning seven shillings, and labourers five shillings a day.

Granting then for the sake of argument the favourite protectionist position of Americans—that a tariff is a premium willingly paid by the nation for the purpose of fostering its budding industries, one fails to see that the iron-master of Western Pennsylvania needs any further nursing. His natural advantages, mechanical skill, and the present price of labour put him on a practically equal footing with his English competitors. The man who gets very rich in America is the manufacturer; the man who pays is the American consumer. I saw a small blast furnace plant near Pittsburg, whose owners, starting with borrowed capital twenty-five years ago, are now millionaires. They did not make this money by their brains, for their furnaces are not so scientific or so productive as many at Middlesborough; and they would probably have done very well for themselves if their customers had been allowed to keep the greater part if not the whole of the import duty on pig-iron in their own pockets.

A bird of passage can only peck at great questions like this one of free trade, but it is clear, and will be admitted by the Americans themselves, that no manufacturer who can profitably sell his goods in European markets requires further nursing at the expense of American consumers. Yet it is a fact that within the last ten years a number of clever American merchants have settled in London, for the purpose of introducing their native manufactures, many of which are sold in England at lower prices than in the States themselves. The raw materials of these goods are often imported from England, and pay a heavy duty on the other side, notwithstanding which, thanks in a great measure to the system of specialization already referred to, the finished articles are re-exported, to compete with all the world in open markets, by gentlemen who claim protection from foreign competition at home. Englishmen need not be anxious for Americans to become free traders. The prospect of an enlarged market in the States for our manufactures is seductive, but the impulse which the abolition of the tariff will give to American skill and enterprise will end, though the people do not see it themselves at present, in their importing fewer and exporting more manufactures than either nation anticipates.

Municipal government is a very weak point in Pittsburg. The town is wretchedly paved, with water-rolled pebbles, the pavements and roads are filthy, and the drainage very defective. I was told by a merchant

residing in one of the principal business thoroughfares, that the tradesmen subscribe for the purpose of cleansing and watering this street themselves, in addition to paying their rates. The tram rails are so badly laid that driving a buggy is dangerous, and in some of the busiest parts of the town the locomotive is constantly shunting cars. Yet just outside the city there are miles of excellent roads which appear to lead nowhere and have only a house or two flanking them here and there. These have been made in many cases by means of municipal corruption. There is a great deal of suburban property on one side of Pittsburg which is convertible from farm value into "town lots" by making roads. The owners of this land do not spend money on the work, because they can find members of the city council who, for a consideration, will vote for "the improvement," and when a sufficient number of councillors have been bought the thing is done. "But why don't you get the representation out of such hands?" says the English visitor, conscious of municipal purity at home. "I guess we are too busy making money," is the reply of the frank man, or "It's the fault of universal suffrage," says the gentleman who can spare no time from private for public business. This abnegation of duty on the part of the natural leaders of the city leads to other results. I found no such thing as a mechanics' institute or any similar organization in Pittsburg, but there are plenty of saloons and beer-

gardens, where the great mining population of the district too often get "full" on Saturday nights, like other similar populations nearer home.

The condition of the farmers at the back of the industrial town forms a strong contrast to this state of things among the dwellers in the city. This part of Pennsylvania was very early settled, and chiefly by Germans, who are old-fashioned, never moving from their homesteads, and still speaking English with a strong accent. Their farms are small as usual, being seldom more than two hundred and fifty acres, and often half that size; but they are a prosperous class of people, who bring up their children well and give them an excellent education.

The Alleghany river, upon whose banks the famous oil regions are situated, is distinguished by floating patches of petroleum. The Monongahela on the other hand is a shallow stream, which taps the chief coal-fields of the district, and being natually unnavigable, is crossed by numerous dams usually full of loaded coal barges. The wharves of Pittsburg itself are crowded with huge stern-wheeler steam-boats, waiting at the present moment for water in the Ohio to take the great fleets of coal barges in tow for St. Louis and the Southern states. Our hotel overlooks the Monongahela, but though it is night, no breath of cool air moves along its valley. The sluggish smoke hangs its opaque curtain

lurid patches appear at intervals upon, and fade from this murky screen. The piazza is lined with the chairs of guests, gasping for air, or talking slowly and with low voices, of patents, contracts, and stock companies. If I speak to a neighbour, he says, "How?" politely, and shows himself ready to discuss the wear of rails on steep gradients, or the character of all the neighbouring railroad tracks; but aside from such subjects he prefers silence. *Ne sutor ultra crepidam* is a golden rule in the States; men seldom talk except about things which they understand, and this makes them seem taciturn, especially when they are with ladies. All the sweet cleanliness of Washington and Philadelphia is gone. My bedroom, whose windows, the temperature being 84°, are necessarily open, acquires a measurable film of "blacks" during the night, and I rise on the last morning of my stay in Pittsburg with a feeling of relief at the prospect of leaving this hot, industrious city, with its dirty and depressing atmosphere, for the fresher air and purer skies of the Alleghany river, whose course we are about to follow to the oil regions of Pennsylvania.

CHAPTER VIII.

THE OIL REGIONS OF PENNSYLVANIA.

Oil City, May 27.

THE early settlers of New York and Pennsylvania States were aware that mineral oil existed in the head waters of the Alleghany river and its affluents, to one of which they gave the name of Oil Creek. The Indians also collected crude petroleum from the surface of Seneca Lake, whence the name of "Seneca oil," and used it, like the settlers, as medicine. Petroleum was first applied to a practical purpose in 1845, by the Hope Cotton Company, who mixed it with sperm oil for the lubrication of their spindles. Five years later it was burned for the first time in lamps, and when its value for illumination was established, the search for a sufficient supply commenced in earnest.

The Pennsylvania Rock Oil Company was formed in 1858, and on August 26 in the following year they "struck oil" at a depth of seventy feet from the surface, in a well sunk about a mile south of the now flourishing town of Titusville. The rush to the oil region which

followed upon this success can only be compared to the Californian gold rushes of 1849–50. Within sixteen months, or by the end of 1860, upwards of two thousand wells had been sunk, and the production became so enormous that oil was a drug, and sold for a shilling a barrel. At the present time there are four thousand oil wells in Pennsylvania, representing a capital of five millions sterling, and yielding annually four hundred and twenty million gallons of oil, having a value of seven millions and a quarter sterling.

The Alleghany Valley Railroad, on leaving the "smoky city," runs for some miles through suburbs of factories, iron works, and oil refineries, whence it emerges on the river which it follows for a hundred and thirty miles to Oil City. The river-banks are at first low and cultivated, but soon rise into high wooded hills, the western bases of the Alleghany range, around whose feet the river sweeps in bold and changing curves. The scenery, though on a larger scale, is remarkably like that of the famous Sharpham Woods on the Dart, and retains the same features all the way to Oleopolis. For more than three-fourths of this distance the route lies through the lower coal measures, and villages, either rural or mining, occur at every few miles. These are collections of wooden houses closely skirting the railway track, which really forms the main street of the village. The hotel, as usual, is practically a part of the depôt, and the best stores and houses are built on

the line. Here and there a neater little dwelling than common displays the name of the doctor or attorney, conspicuously painted on a big sign-board. With a little more of the picturesque about their construction, these wooden dwellings might recall the homes of Switzerland, but there is nothing out of America to which an American village can truly be likened. The male inhabitants, who loaf about the depôt in some numbers on the arrival of a train, appear to have plenty of leisure, and are dressed in shirt-sleeves, wide straw hats, and wellington boots drawn over their canvas "pants," a costume which, like that of American artisans generally, wears an air of compromise between the claims of labour and society.

When once the great cities are left behind, the traveller soon discovers that there are no conventional "ladies and gentlemen" in America, the national machine being run for and by working men. Our car was occupied by a party of boiler-makers, most of whom being already "full," were of course anxious for another drink of "old Bourbon" at every stoppage, and the journey was consequently enlivened by a fight, an exhibition of fine art in oaths, and an accident to one of the gentlemen boiler-makers, who having delayed too long at a particularly seductive "bar," jumped for the train, already in motion, and landed face downwards on the track. Sympathizing friends administered whisky externally and internally to the wounded man during

the remainder of the trip, and when we left the cars at Oil City, the interesting invalid was as well as could be expected under the circumstances.

Incongruity, naive as Mrs. Malaprop herself, is one of the characteristics of America. One meets with it everywhere, from the public bar, the luxury of whose furniture and decoration is little in keeping with the very mixed society frequenting it, to the palatial buildings which spring from the unkempt streets of the great cities. But nowhere is this quality more oddly exemplified than in the names of the stations on the Alleghany Valley Railway. Not long after leaving Pittsburg, we found ourselves at Verona, and hardly had we equilibrated our boiler-makers with this classic name, than we arrived at Kittanaing, running thence in rapid succession through Cowanshaock, Parnassus, Catfish, Tarentum, and Scrubgrass.

Shortly after leaving Scrubgrass, the train enters the oil region. The scenery still consists of wide river sweeps, flanked by high wooded hills sloping steeply to the water; but this primitive simplicity is suddenly broken by a forest of derricks, which line the river on both sides, or show their heads among the trees on the hillside, and even crown the hill-tops. A derrick is like the tall wooden framework called a pile-driver, with which every one is acquainted, but more strongly braced together, and about seventy feet high. Below it is the oil well, a hole of some few inches diameter, sunk, it

may be a hundred, it may be a thousand feet into the ground. It is bored by means of an iron bar, armed at its lower extremity with steel, or, in the case of very hard rock, diamond cutters, and attached to the "walking" (or oscillating) beam of a small steam-engine. While the borer delivers a succession of blows, it is slowly rotated by hand, forming in fact a "jumper," exactly like those used by quarrymen in drilling for blasts, and as the hole deepens, length after length is added to the borer by screwed unions. A pulley fixed in the head of the derrick, together with a wire rope and windlass driven by the engine, furnish the means for withdrawing the boring rods from the well, in order to clear it of *débris*. A clever instrument called the "sand pump" is used for this purpose. It consists of a sheet-iron cylinder with a butterfly valve at the bottom, which on the removal of the rods is lowered by means of the rope and pulley into the hole. Water being either present or supplied, the sand pump sinks into the soft mud left by the borer, and the valves closing on its withdrawal, it comes to the surface loaded with *débris*. With these simple tools the well-sinkers of Petrolia pierce the hardest rocks and bore to enormous depths, dealing with difficulties caused by the irruption of water or breakage of rods with the utmost ingenuity.

The well when bored may, if productive, be a "spouter" or require pumping. The most remarkable example of a flowing well is the Lady Hunter, near Petrolia

City, where oil was struck on October 9, 1874, and the fact proclaimed by a tremendous rush of gas, followed by a jet of petroleum, which shot upwards in a column more than a hundred feet high. Three thousand barrels were ejected on the first day, and nearly one hundred and sixty thousand barrels within the following six months, at the end of which time the well was still flowing at the rate of one hundred and fifty barrels a day. The wells on the Alleghany river have long ceased to flow, and the oil is pumped up by the engine, which forces it through pipes into great storage tanks, whence it flows as required to discharging depôts situated on the railway; light wooden scaffolds fitted with a number of delivery pipes, nozzles, and cocks, by means of which a train of tank cars is rapidly filled. The tank cars are cylindrical vessels, like boilers mounted on railway wheels and axles, holding eighty barrels each, and about four thousand of them are always about on the lines, or lying at the discharging depôts of the district. Three thousand miles of pipes have been laid for the transport of oil from its various sources to the storage tanks and railways, accomplishing silently and cheaply work which, if carried by road, would need more than a thousand waggon teams.

Gas usually rises from oil wells for some time before the flow of oil is established, and in some cases continues to do so permanently. There are iron works in Western Pennsylvania fired with natural gas, which is sometimes

carried as far as forty miles from its source to the factory.

The blackened ruins of derricks and engine-houses beside the track tell of the frequent occurrence of fires in the Alleghany valley, and discharging stations are occasionally passed where a ghastly skeleton of iron pipes supports itself above the ashes of its wooden scaffold, one knows not how. The strip of forest between the rails and the river is cumbered with charred trees sometimes still smouldering, while clouds of smoke rolling up from the woods tell us that, even as we pass, a great forest fire, whose flames we cannot see in the daylight, is raging on the opposite hillside.

In the centre of this strange district lies Oil City, built on a small delta formed at the junction of the Alleghany river and Oil Creek, and hemmed in by high bluffs, up whose steep sides the town tries to clamber. This place is no longer the head-quarters of the oil trade, which, so far as production is concerned, has, since the discovery of flowing wells in another Pennsylvanian county, gone to Bradford; but the oil exchange is still held here, and the town is the centre of all large buying and selling operations.

The process of refining crude petroleum is one of distillation. Volatile bodies such as benzine come over from the stills at a very low heat, and as the temperature is gradually raised, a variety of other products appear, terminating in paraffin, which distils at about 1000°

Fahr. The oil, deprived of its volatilizable constituents, is treated with sulphuric acid to remove carbonaceous impurities, neutralised with caustic potash, washed, and finally barrelled for exportation. A residuary product resembling coke is burnt under the refinery stills.

Oil claims, a hundred feet long by fifty feet wide, used to sell for £400 in the palmy days of Petrolia, but since the comparative exhaustion of the district, similar properties are not worth £50. So many wells have been sunk that none are now flowing; some are not worth pumping, and others, which used to yield from fifteen hundred to two thousand gallons a day, give no more than twenty-five gallons. Still the aggregate production is large, and the Alleghany district furnishes a considerable proportion of the whole American export of petroleum. The crude oil is stored in large circular iron tanks, covered in from the rain. These are usually painted bright red, and being much like gas-holders in appearance, have a strange effect, peeping out from isolated spots among the trees of the primitive forest. Though protected by conductors, tanks are sometimes fired by lightning, and flowing wells, especially of gas, have frequently been accidentally ignited. In the former case the vessel is usually broached, by cannon if need be, and the fiery stream allowed to flow through the forest to the river. Explosions of gas, or oil spouters, on the other hand, occasionally offer phenomena not much inferior in splendour to those of a volcanic eruption.

Though peaceful now, the very appearance of this oil region, more like a field of battle than a field of industry, awakens reflections which only slumber even in the settled cities of America. Life in the New World is visibly a battle. Civilization and Nature are at open war; and man, the soldier of civilization, must conquer or die. To clear the virgin forest and transform it into cultivable land; to bring the grassy plains of the vast prairies under the plough; to make railroads across a scarcely known continent, and join cities parted by immense deserts; to fertilise these rainless wastes by means of the mountain snows; to control the Red Indian from frontier forts, or to prospect the lonely cañons of the sierras;—to be, in fact, the pioneers of coming generations: this is the task imposed upon the American people of to-day.

The struggle is not for mere subsistence, as with the masses of Europe. In the New World man is rather a gladiator than a labourer. Thrown into an arena where enormous gains may reward victory, he would not, if he could, avoid the combat; and be he backwoodsman, prospecter, oil-seeker, or frontiersman, nay even an engineer or a geologist, he leads the feverish life of a military chief whose aim is conquest and whose home a camp.

CHAPTER IX.

ODD PHASES OF FAITH AND FEELING.

Lake Chautauqua, Jamestown, May 28—June 4.

AFTER a month spent in the industrial cities, with the thermometer well up among the nineties, the traveller is glad of a few days alone with Nature, and we found her in one of her most peaceful aspects at Lake Chautauqua, where we halted for a rest on our way from the oil-fields to Buffalo. This little sheet of water, only a few miles distant from the eastern shore of Lake Erie, lies among low, softly rounded hills, in the middle of the finest dairy district in the state of New York. Its banks are park-like, and the surrounding scenery that of a cultivated and undulating English county, while its elevation of thirteen hundred feet allowed us to read with equanimity of New York City prostrated by a temperature of ninety-eight degrees. These sufferings of others, indeed, as in the days of Horace, seemed to enhance the pleasure of our daily cruise and dip, and give zest to the capture of every pickerel and catfish.

Thus lotophagously sailing, we landed one morning on a beautifully wooded point in search of a shady place

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for lunch; and, pushing our way through the thick maples, found ourselves in the streets of an apparently deserted village. It was a large, irregular group of pretty wooden cottages, built among, and completely embowered by virgin forest. Not a soul was to be seen, and we strolled through a labyrinth of leafy avenues, stumbling at length on a vast open-air auditorium, capable of seating several thousand people, but roofed only by graceful maples. We passed from this into a grove, where the young trees were labelled with white tablets bearing reverend names, which were repeated in the streets and avenues. The Rev. S. Strong, Professor Vail, and the Rev. Lewis Miller were among the chief sylvan deities; but the largest maple of all was consecrated to Mr. P. P. Bliss, the gifted composer of Moody and Sankey's music, in immortal verse as follows:—

"The finest tree in the lot, I ween,
Spreading so tall, so broad, so green;
Beautiful, beautiful, beautiful tree,
How very much you are like to me!"

Much impressed but not enlightened by the inscriptions in the sacred grove, we continued our search for information, and found ourselves successively before a building called the "Jewish Tabernacle," a model of Cheops' pyramid, and, finally, in the "Park of Palestine," evidently a relief map on a large scale of the Holy Land. Everything was labelled, but the more labels we read, the more puzzled we got. At length we struck

a big regulation Yankee hotel, where we found a waiter smoking a cigar stub and wearing a week's beard, but who proved in other respects a worthy man. Although the establishment was evidently not "running," our friend "guessed he could fix us," and not only gave us a better lunch than our boat could furnish, but became our guide, philosopher, and friend for the rest of the day.

The Chautauqua Lake Sunday School Assembly is a vast educational, religious, and recreative institution, to which tens of thousands of people resort every season. This organization sprang out of the old camp meetings, and still retains some of their characteristic features, while it occupies an old camp meeting ground. It is the creation of the Methodist body, and was only established in 1874, but is being rapidly imitated by other religious communities, notably by the Baptists, who are building a similar, but more ambitious holy village on the opposite shore of the lake. The assembly meets early in August, and opens its session by a tremendous dinner at the hotel. We had the privilege of seeing the printed *menu* of last year's feast, containing eighty-six dishes, which were honestly partaken of, dish by dish, by many excellent Methodists, if the statement of the waiter may be believed. The association comprises all the Methodist school teachers in America, most of the Methodist preachers, and a great number of Methodist families and children. The houses belong to the members, and are built on land purchased from the association under

certain conditions. No intoxicating liquors are allowed ; lights must be out at ten o'clock ; sabbath-breaking is strictly prohibited ; and subjection to the rules and officers of the assembly enforced. More than six thousand people live here during the session, which lasts three weeks, and there are often as many daily visitors as residents. A newspaper, printed on the ground, publishes a programme of proceedings for each day, every hour being apportioned either to meetings of societies, religious services, the teaching of children, or amusements of some kind. The Chautauqua Assembly is a kind of cross between Exeter Hall, the Sunday school, and the "Hall by the Sea" at Margate.

The meetings embrace those of the National Educational Association, the Chautauqua Teachers' Retreat, the School of Languages, the Foreign Mission Institute, the Musical College, the Literary and Scientific Circle, together with lectures, concerts, class drills, stereopticon experiments, fireworks, the Brush electric light, and illuminated fountains. Certainly a remarkable *pot-pourri* of instruction and amusement. In the grounds are models, already referred to, of Palestine, Jerusalem, Mount Ararat, and the ark, the Jewish tabernacle, the pyramids, etc. Lake Chautauqua itself represents the Mediterranean Sea, and the ground to the eastward of it is fashioned into a great relief map of Palestine on a scale of an inch to the mile. The river Jordan, admitted through a tap, flows from its head waters at

Dan through the Lake of Merom, the Sea of Tiberias, and the Dead Sea successively. Perched on the high land west of the Jordan stands a plaster model of Jerusalem; a little south of it is Bethlehem; while salient points in Scripture history, such as Pisgah, the Mount of Olives, Ramoth-Gilead, Nazareth, Capernaum, Bethsaida, and others are duly located, and Sinai, rather out of place, dominates the whole. Once a day a teacher, dressed in Oriental costume, addresses an audience seated around the model, on the history and topography of the Holy Land. Thence the class proceeds, it may be, to Ararat, to see a dove let fly from the window of the ark, or to the wilderness, where the miracle of Horeb is repeated, by means of a cleverly hidden tap and the teacher's wand.

But amusement also plays a great part in the proceedings of the assembly. There are hourly excursions of steamers; rowing and sailing boats are laid up by the score under the maples; bathing houses line the lake where, dressed in becoming costumes, Methodists of both sexes join in the refreshing dip. Bazaars, ice-cream saloons, and bars for effervescing drinks are scattered here and there among the trees, which are threaded in all directions by secluded and romantic forest paths. At night there are lectures, entertainments, concerts, recitations, magic lanterns, and fireworks, while the woods glimmer with the scattered lights of Japanese lanterns. The curfew rings at ten o'clock, and at the

same moment the electric lights are extinguished, and the candles of the Japanese lanterns expire. But the moonlight silvers the maple leaves; the fireflies hang their golden lace around the lake shore; the air grows balmier, and the forest paths more mysteriously romantic as the cool delicious night descends. Is it difficult to believe that an unwritten programme of entertainments commences with the curfew? or must we suppose that emotion has been exhausted by the religious exercises of the day?

The stubbly waiter was only a Philistine sojourning in this Judæa, but such were not his views. He had been very kind to us, showing us everything, and explaining the Holy Land, the ark, and the miracles, with an evident wish that we might enjoy the whole thing as much as he did. "Many a time," said this Amalekite, "I hev sot on Sinai with a 'tony' gal, and watched the old patriarch work Horeb. Ef you'll come hyur and see the machine running in August mister, I guess I'll fix you in the best room on Ararat; thet ark is kep' for high-toned company, and you'll hev a good time, you bet. Why there's just a thousand gals flirting at you as soon 's your nose is inside thet amphitheàtre."

Lake Chautauqua is full of bass and pickerel, the latter a handsomely coloured fish like a pike in shape, as its name implies. It is taken by spinning and spearing, and is excellent eating. The fishing begins on June 1, when the lake is visited by many parties of ladies and

gentlemen, who make a little festival of the opening day. On this evening there befell the most beautiful sunset which we had yet seen in America. We sat in the verandah of the hotel, watching the play of orange and crimson lights between the sky and the calm water till night fell, and the fireflies were darting to and fro among the trees. Presently a glowing point, like a larger firefly, slid out over the now dusky water from a wooded bay. It was the distant light of a pickerel spearer, and was soon succeeded by others, some nearer, some farther, until the whole surface of the lake was strewn with slowly moving meteors. Each boat carries two men, and a petroleum torch is fixed in the bow. Behind this stands the fisherman, his eyes protected from the glare by a screen. The second man rows the boat slowly along, and as the fish are attracted by the blaze the spearer delivers his weapon. It was a beautiful picture. A light mist lying on the surface of the water, concealed the boats themselves, while the trees were hung with the fireflies' nets of golden thread, through whose quivering meshes we saw the gliding torches cross and recross each other, as in the slow, decorous figures of a dance. This silent but moving scene was canopied by a violet-black sky, sprinkled with brightening stars, while a line of pure yellow in the west reminded us of the faded sunset, as a strain from the overture sometimes lingers in the opera's sweetest air.

May 31 is Decoration Day, and a general holiday in

America, when a procession is formed in every town for the purpose of visiting and decorating the last resting-places of soldiers who fell in the civil war. We went to Jamestown, at the extremity of Lake Chautauqua, for the purpose of witnessing this national ceremony. The procession was headed by a poor and noisy band, followed by a score of veterans carrying their old regimental colours. Only one of these men wore a uniform, which was shabby and ragged; the rest were dressed like, and probably were, mechanics. Behind them came a "fire company" in brilliant uniforms, their engine and life-saving apparatus shining with plating and paint. A second fire company followed in still finer cream-coloured clothes, white ties, and white kid gloves, and then the *hoi polloi*.

We marched with the last two miles in a blazing sun, the band playing dirges; and upon arrival at the cemetery, wound our way among the maples shading the graves to a stage already occupied by several ministers of religion, the orators of the day, and a choir. Proceedings commenced by decorating the graves with flags and flowers, after which every one gathered in a grassy amphitheatre around the platform. Prayers, choral singing, and addresses followed. The first were of the usual type, and the vocal music was good; but the speeches were the most notable features of the day, and that chiefly from their evident effort to do justice to the memory of brave men without wounding the sus-

ceptibilities of old foes, who are also fellow-countrymen. Civil war is the last misfortune of nations. Victor and vanquished are after all brothers, and the memories of the fallen on both sides would perhaps be better kept green by the silent strewing of laurels. Apparently the speakers felt this, for while fully expressing their reverence for the dead, a generous sensibility for others gave that feeling a much more general expression than would have been the case if the soldier had fallen in conflict with a foreign foe. Hence the nation rather than the national heroes was exalted, and it is excusable if this circumstance lent some extravagance to the words of men striving to honour brave sons by praises of their mother country.

"We stand to-day," said one of the speakers, "the foremost nation in history. The rulers of Europe are viewing with astonishment our rapid advancement, boundless resources, and the contentment, happiness, and prosperity of our people; while they witness with fear the discontent, turbulence, and unhappiness of their own. Pointing to her network of railways and telegraphs, her cities and villages, her two million farms, her boundless prairies, her vast tracts of forest, her fields of coal, her mines of iron and gold, her rattling looms, and the deep bass of her million spindles; to the smoke of ten thousand furnaces; to her homestead law, giving a farm in fee simple to whoever will work; to her schools and churches, her fifty millions of contented people, sheltered

by the o'erhanging branches of the tree of liberty;—she proudly says to the world, 'These are the fruits of a hundred years in a nation conceived in liberty and dedicated to the proposition that all men are created equal.' Meanwhile in Europe, Nihilism and Socialism, seeking revenge in open revolution or cowardly assassination, are the legitimate growth of misgovernment, and of the natural desire on the part of the people to escape the burden of vast armies raised to support a power which they hate, and to escape from a pernicious land system which robs the labourer of the fruit of his industry."

Two candid Englishmen, sailing back in the cool evening to their hotel on Lake Chautauqua, found it necessary after much discussion to agree that if there were some "brag," there was little "bosh" in the oratory of Decoration Day at Jamestown.

CHAPTER X.

NIAGARA.

June 5–12.

EVERY tourist must visit Niagara but need not re-describe at length the great Falls, about whose beauty and sublimity enough has perhaps been said. The Niagara river is the overflow of the four great lakes, and its course between Eric and Ontario is made famous by the drop of a hundred and sixty feet over which the waste waters of these great inland seas take a sudden plunge. There is none of the usual prettiness of a cascade about this fall, whose enormous mass constitutes its chief claim to the admiration of the world. The river splits on Goat Island, but the bulk tumbles over the Canadian, or Horse-shoe Falls, beside which the American falls look like a weir. And the eye soon selects the crown of the horse-shoe as the central point of the picture. There, a translucent curve of green water bends slowly from the horizontal to the vertical, and plunges with apparent deliberation over the precipice, to lose itself almost immediately in froth and mist, while out of the hell-broth below rise clouds of the

finest spray. These children of the air give the chief beauty to Niagara, for the smooth, repeated liquid curves and restless foam soon pall on the eye. The mist on the other hand, changes from beauty to beauty with every alteration of atmospheric conditions. Sometimes it sways hither and thither, like gauze in the shifting winds; at others it rises in unbroken columns whose capitals float away in billowy cumuli to join their shining companions in the blue. When the air is moist and the wind blowing gently from the falls, the valley becomes filled with luminous fog. On rarely bright still days, a shaft of vapour rises to more than a thousand feet in height, forming a stationary pillar of cloud, white as snow above where it is lost by absorption, and iridescent below where its base is wreathed in rainbows.

The country between Lakes Erie and Ontario consists of a nearly level plateau, terminating suddenly twenty-two miles north of Lake Erie in the bold precipitous cliffs nearly three hundred and fifty feet high, called Queenstown Heights. At their feet lie the towns of Lewiston and Queenstown, one on either side of the river Niagara, and thence the ground slopes gently and regularly to Lake Ontario. The cliffs are evidently an old shore-line, and the flat country was once a sea-bottom. The Niagara river issues from Erie in a wide tranquil stream, and flows over the surface of the plateau for about fifteen miles, when rapids occur, and then the

cataract, the stream falling suddenly into a narrow gorge. This is best described as a trench three hundred feet deep and varying in width from two hundred to four hundred yards, which winds for seven miles like an artificial excavation through the plateau to Queenstown Heights, where the river debouches into the flat country, and flows in an almost level course to Lake Ontario.

The strata on either side of the gorge, being nearly horizontal and formerly continuous, early suggested the idea that the falls once poured over Queenstown Heights, and have cut their way back to their present position. The existing lip of the cataract is a bed of hard limestone about eighty feet thick, supported by a similar thickness of friable shale. The falling water gives rise to extremely violent blasts of wind in the space between itself and the rock, which is consequently lashed with a perpetual storm of heavy spray. As the soft shales gradually yield before this attack, the limestone capping becomes undermined and drops from time to time, causing the falls to recede. The process is of course extremely slow, but there is some evidence of a slight change of position within half a century, while a description of Niagara, written in 1678 by the Franciscan missionary Père Hennequin, leaves no doubt that considerable alterations have taken place during the last hundred and fifty years. As however Hennequin was the first European to see the Falls, and that only a century and a half ago, the historical proofs of their recession are very slight; but

fragments of an old river bed, containing shells of existing species, were found by Lyell on the banks of the present stream, and level with the plateau, at several points in its course between the falls and the escarpment at Queenstown. This fact leaves no reasonable doubt that the Niagara once flowed from Lake Eric across the whole width of the plateau to the edge of Queenstown Cliffs, whence the cataract has cut its way slowly back to its present position.

It would be extremely interesting if a regular rate of recession could be established, for this would enable the geologist to measure the minimum lapse of time which separates us from the gacial period, after whose occurrence the gorge in question was commenced. But the strata already cut through are of very various degrees of hardness, while in consequence of a slight inclination in the bedding, the hard rock forming the present lip will be at the bottom of the Falls when they have progressed two miles further southward. Wind and spray will make little impression on this compact limestone compared with what they now effect in the soft shales, and the cataract will probably remain almost stationary for ages, as has doubtless already been the case more than once in the past. Hence no reliable estimate can possibly be made of the lapse of time required for the digging of the trench. All that can certainly be known is that enormous periods have passed since the Niagara began to drain the upper lakes, yet the mollusca living

in its waters to-day have undergone no change during all that time, as the shells found in the old river-bed testify. If then, living forms have remained unmodified at least as long as, and it may be much longer than, the time occupied in cutting the gorge in question, what must be the chronology of the whole geological succession to which the age of the phenomena in question bears an absolutely inappreciable proportion?

Excursions can be made to the back of both the Canadian and American falls, but that behind the latter is the more extensive and interesting. We dressed for the trip in waterproofs and list shoes furnished by the guide, whom we followed through the spray down a rough wooden stairway and path at the side of the Falls, until we reached the bottom, and then crept carefully along the face of the rock. Gusts of wind loaded with heavy spray made us shut our eyes and catch our breath at first, but once wet through, we advanced without further discomfort through a constantly increasing storm of wind and water. Here and there we found spots where local calms—due no doubt to the configuration of the rocks—prevailed, and in such places it was possible to keep our eyes open, though there was absolutely nothing to be seen except the heavy spray. On leaving the last of these shelters, the blasts became so violent as to suggest the propriety of holding on to something, and we thought that erosion of the shaly beds must be proceeding rapidly in such a hurricane.

After traversing a hundred and thirty-five feet, our guide stopped, declaring that it was impossible to go further; so we returned to daylight, not a little disenchanted after all the extravagant accounts we had heard of this trip. There is no real interest in penetrating behind the cataract, and a heavy thunderstorm in the absence of an umbrella is certainly more emotional. The guide showed us a spot below the falls where a safe backwater tempted us to a dip. We wanted no more tubbing than we had already had in the "Cave of the Winds," but only to say that we had swum in the rapids of Niagara.

About twenty-five years ago a Mr. Allen made a serious attempt to utilize some of the wasted water-power of Niagara. With this view he dug a large canal from a point on the river above the falls to a plateau well adapted for building, about two miles below them. Here he proposed to erect a number of large turbines and let out power to factories which it was expected would be attracted to the neighbourhood. But the early works exhausted his resources. He became ill, and was forced to connect himself with others, who asked too high a price for their water privileges, and so the scheme failed. Allen's canal has now become the property of a wealthy and enterprising man, who has erected upon it a magnificent grist-mill driven by wheels of a thousand horse-power, together with a paper-pulping mill, a manufacture which requires a large supply of both power and

water. The question of how best to utilize the forces of nature is much discussed in these days. Electricians declare that the mountain, hitherto considered immovable, is to be brought to Mahomet; and meanwhile the potential group of factories at Niagara and the actual collections of workshops at Belle Garde in Switzerland, and at the Falls of Schaffhausen on the Rhine, demonstrate the possibility of utilizing waterfalls. Coal itself is only a reservoir of energy, which we can tap when and where we please, but it is difficult of access, while the Falls are a great natural force, which is freely at the disposal of man.

While at Niagara we witnessed an obscure but spirited single-handed struggle between man and the natural force under review. In the spring of the year a great scow, coming out of Chippewa Creek, broke loose from the tug and entered the rapids. She stranded on a shallow a few miles above the falls, in a position threatening the destruction of one of the small suspension bridges connecting the left bank of the river with a group of islands. The current at this point runs at a speed of twenty miles an hour, and the scow lay about a hundred yards from shore. Some rough trestles having been prepared, a man took one of them on his shoulders, and waded out into the stream with it for a distance of about ten feet. Here he pitched the trestle, and his mate pushed a plank out from the bank till its end landed on the frail pier. By the pathway thus constructed the wader

returned to the mainland, and shouldering a second trestle again crept cautiously out into the current. The second was pitched like the first, and twenty feet out of three hundred were bridged. Within a few hours some fifty yards of staging was finished, when the wader reported, "Thar is three foot of water in a derned hole ahead, and we'll hev to pitch the next two trestles with a rig." We had no time to wait till the rig was made, and do not know whether this hero succeeded in reaching the scow; but if he was drowned there is one brave man the less in the world. The speed of the current was fearful, the bottom was of course concealed from view by the broken water, and the sound of the Falls was loud in our ears. A false step was certain death, for once fallen, recovery was impossible in such a stream. Yet, feeling his way with a pole, and loaded with the heavy trestle, without whose weight he could not have kept his feet, the man crept carefully but confidently out from shore, apparently as thoughtless of danger as a bricklayer's labourer on a ladder.

From the Arctic regions to the latitude of New York, the whole breadth of North America is covered with glacial drift, which varies from six hundred to two hundred feet in thickness in the middle and north-western states, while southward it becomes thinner and more evenly spread over the country. The drift consists of a vast accumulation of sand, pebbles, and boulders, always belonging to rocks lying north or north-west of their

position, with beds of clay also evidently brought from the north by causes quite different to any of those now at work. Nearly every recently uncovered rock in the drift-covered region is grooved, scratched, or polished, and these marks point generally north-west, north, or north-east. Throughout these areas, erratics, or travelled blocks of stone, are found, which can only have been transported to their present sites by ice. It was for a long time a question whether land or sea ice had been the carrier of these various deposits, but it is now admitted that Agassiz's theory of an ice-sheet, continuous from the Arctic regions to the latitude of New York, is the only way of accounting for all the facts of American glaciation. Professor Dana has estimated that this sheet was not less than twelve thousand feet in thickness on the watershed of the St. Lawrence and Hudson's Bay, diminishing to four thousand feet on the east coast. Midway across the continent the vast *mer de glace* coalesced with a similar sheet issuing from the Rocky Mountains, whose summits were not covered, although the higher valleys were filled with enormous glaciers which fed the general mass below. In the course of time the rigorous climate of the glacial period changed. The ice retreated successively from the lowlands, the highlands, and the mountains, leaving Central America drowned in an inland sea derived from the melting ice. In the still waters of these internal oceans the alluvial soils of the Mississippi and Missouri valleys were laid

down, and finally the inland seas themselves dried up under the influence of an arid climate, and the present land surfaces appeared. Unless mountainous, the country north of the fortieth parallel is almost uniformly drift or alluvium, through which the underlying rocks rarely protrude, and the traveller going north or west after leaving the flanks of the Alleghanies, finds the surface everywhere composed of beds of gravel, sand, or alluvium.

The surface of the plateau about Niagara is thinly covered with glacial drift, stripped of which the limestone is seen to be scored all over by ice. The marks are beautifully preserved and all point to the north. Travelled blocks of various primitive rocks, some of them many tons in weight, lie scattered in all directions. These are evidently derived from the gneisses of the watershed north of the great lakes and the St. Lawrence, and but for the forests which clothe the country about Niagara the whole district might seem to have just emerged from the ice-sheet of the glacial period.

The Niagara limestones weather into a soil carrying excellent crops of artificial grasses, while the shaly beds yield clays which form capital wheat and grass land. But the best farms are found on the warm sandy soils of the drift. A particular strip of this, bordering the river, and comprising only a few square miles, is especially suited to fruit-growing. Its apple orchards are very productive, and the trees exceedingly fine.

Peaches, strawberries, and raspberries are extensively grown, and come in very early. Vines are being rapidly introduced around Niagara in the hope of replacing the peaches, which have suffered from a leaf disease during the last few years. The farms are small, fifty acres being the average size, while a hundred acres is rarely exceeded. Good land changes hands at from £20 to £30 per acre, and sometimes yields more than its cost in a single year's fruit crop. I saw one vineyard of three acres which last season produced eleven tons of grapes, worth £12 per ton. A Canadian vineyard, like other American industries, is rough and ready. Essentials are cared for, but finish is disregarded. The ground having been prepared by the plough, receives rows of wooden posts, driven about thirty feet apart, along which are strained three lines of old telegraph wire. Two vines are planted in each thirty-feet space, and six or eight shoots are trained vertically to the wires with cotton twine. The birds carry off these strings for nest-building, and it is a common thing to find nests among the vines constructed entirely of cotton thread ; whenever a vine falls it is sure to be because the birds have untied it from the wires.

Farming only pays here when a man goes thoroughly into it himself, becoming his own bailiff and his own hind ; labour is so dear that every operation must be skilfully economized, and a gentleman farmer would be bankrupt in a very short time. Still the village of Drummondsville, which is a centre of the rural industries

round Niagara, is a flourishing place, and the farmers' wooden houses, if simple, are very comfortable. The farmers themselves are shrewd, active, and evidently prosperous, with the manners of business men rather than those of our agriculturists, though that pleasant rusticity which seems inseparable from the cultivation of the soil is not entirely wanting.

There is an Indian reservation near Niagara, where a tribe of Tuscaroras were settled by treaty nearly a hundred years ago. It is six square miles in extent, and occupied by four hundred families, each owning a house and land. No model village in England is more inviting in appearance. The fields are clean and well farmed; the crops, whether of grain, grass, or fruit, are magnificent; the fences are in good repair; the stock consists of handsome and healthy Durhams; the houses are well built, clean, and neat; and the whole reservation is superior in finish to American farms in general, challenging comparison in this respect with Lincolnshire or the Lothians. A heavy thunderstorm occurring during our visit, caused us to seek shelter at the house of Mr. Mount Pleasant, the chief of the tribe, by whom we were hospitably welcomed. The chief is a fine old Indian, who though nearly eighty years old, is as upright and active as a young man; and his wife, who belongs to the Senecas, is a quiet, shrewd woman. The house is a very pretty wooden building, excellently furnished, and provided with an abundance of good books, pictures,

photogaphs, a piano and harmonium ; in fact, a home of refinement. There was a daughter, educated in one of the eastern cities, who sang and played beautifully, and was very agreeable and intelligent. A Boston lady, interested in ethnology, was a guest in the house, collecting Indian folk-lore, and we were soon engaged in conversation with her about primitive man and the local geology. A strange position under the roof of a redskin. Yet some of us are bold enough to prophecy that peasant proprietorship will effect no change in Irish character, which seems almost equivalent to saying that the red man is more civilizable than the Celt. Our fair investigator had made one unfortunate expedition during her stay at the reservation. The chief assured her that skulls had been found in the neighbourhood, belonging to a race of men of whom the Tuscaroras had no traditions, and that these skulls were brachycephalic (Mr. Mount Pleasant used other words) to an extraordinary degree. She at once persuaded two young men to dig at the indicated spot, and at night, in order not to arouse the prejudices of the Indians. Skulls were found, but they did not differ from existing types, and by-and-by it was discovered that the forefathers of half the tribe were being disinterred.

CHAPTER XI.

ON THE GREAT LAKES.

June 12–15.

WE determined to travel by way of the great lakes to Chicago, making a short stay at the Straits of Mackinaw, between Lakes Huron and Michigan, for the purpose of seeing the timber or "lumbering" industry. From the Falls to Buffalo is twenty miles, the railroad skirting the Niagara river, and traversing a level country rich in apple and peach orchards. Buffalo lies half on Lake Erie, and half on the Niagara, and its position at the foot of the great chain of lakes gives the town considerable commercial importance. Here we found the steamer *Oneida*, one of the strange-looking lake-boats, having sides strengthened by deep "bowstring" girders running almost from stem to stern, and making the vessel look like a Noah's ark carrying a railway bridge as deck freight.

American steamers combine the sea-going and shore-going elements very curiously. The British shipbuilder gives such a nautical character to every feature and

fitting of a vessel that a landsman always feels his lubberhood keenly when on board ship. He is naturally crushed by a sense of ignorance on deck, but it is little better in the saloon whose approaches, seats, lighting, and accommodation differ from anything he has ever seen on shore; while his berth, with its port-hole, narrow bunks, and borrowed lamplight, is not a bed-room, but the roost of a tar, off watch. The traveller on board such a ship is never allowed to forget that he is only a passenger, or to lose sight of the humiliating nature of his position. In the States on the other hand, ships are made for passengers, not passengers for ships; and a landsman loses none of his accustomed dignity on taking up his quarters in the hotel-afloat which American shipbuilders have created. The deck itself has a less professional air, the saloon has a staircase, lights, tables, chairs, even doors, hinges, and handles, like those to which he has been accustomed; his cabin contains a real bed, and being on deck, is lighted by sliding sash windows, shaded with blinds, as in his own house. There is nothing of the "old salt" about the captain or crew, who may, and probably have, followed many occupations before becoming sailors. All this is pleasanter than sailing in more nautical craft under scornful nautical eyes.

The low pine-clad shores of Erie were lost sight of soon after leaving Buffalo, and there was nothing to relieve the monotony of the ocean-like scene except

occasional meetings with grain ships. The agricultural states of Western America may be practically regarded as anxious to send all their surplus food stuffs to Liverpool, and Chicago is the centre where the grain collects. From this point there are three routes to the eastern seaboard : first, by rail direct from Chicago to New York, Philadelphia, or Baltimore ; second, by way of the lakes to Buffalo, and thence by the Erie Canal and river Hudson to New York ; third, by the lakes to Buffalo, and thence through the Welland Canal to Montreal. The railway is of course the quickest of all these routes, but competition with shipping freights has greatly reduced the profits of the carrying companies, who wear out their rails and rolling stock to little advantage. Still the bulk of the grain traffic between Chicago and the Atlantic goes by rail, a great deal of stuff being picked up in Indiana and Ohio, states which lie east of Chicago and off the water routes. Grain shipped by the lakes and Erie Canal is carried in sailing vessels, or steamers, or towed in very large barges to Buffalo, where it is transhipped by means of "elevators" into the boats of the Erie Canal and, arrived at New York, is again transferred into Atlantic vessels. Cargoes were formerly shipped on the lakes exclusively in sailing vessels, but these have competed of late years with steamers of fifteen hundred to two thousand tons burden which are more profitable to the shipowner because of the greater number of trips they can make in the same time.

Recently a new system has arisen. The large steamers, which carry passengers as well as cargo, are expensive both in first cost and maintenance, and are consequently being replaced by enormous barges, two or three of which are towed by a powerful tug. A tug is costly only in respect of its engines, the rest of the ship being cheaply built, while it only needs a crew of four men, instead of the twelve or twenty required by a great lake steamer. The barges are rigged with masts and sails, and are cast loose from the tug on bad weather arising, when they either fend for themselves, or shelter behind a point until the storm abates, after which they are again taken in tow. Each barge carries from thirty to forty thousand bushels of grain, the tug holding another fifteen thousand bushels, and the system beats both steam and sailing vessels for economy.

With the arrival of grain at Buffalo there begins a competition between the United States and Canada for the transport trade of the north-west, and it is still an open question whether Montreal or New York will ultimately control the grain traffic of America. The Erie Canal, which connects Lake Ontario with New York, is a great national work begun under difficulties in 1809, delayed by the war of 1812, finished in 1825, and enlarged in 1862. It is three hundred and fifty miles long, but no more than seven feet deep, and only admits barges of two hundred and twenty tons burden. From its commencement to its completion

the Canadians watched the progress of the Eric Canal with keen interest, and finally, one of the clearest-headed men in the colony, William Hamilton Merritt, devoting years of enthusiastic labour to the construction of a rival route, caused the Welland Canal to be built, which, connecting Lakes Eric and Ontario by a channel twenty-seven miles long, cheats the Niagara Falls, and gives a clear water-way from the upper lakes to the head-waters of the St. Lawrence. This river is itself obstructed by rapids near Montreal, which were avoided by cutting a second canal, eight miles and a half in length, past the Lachine rapids, the two works together affording access from Lake Superior to the Atlantic. The Welland Canal was originally ten feet and a quarter, and the Lachine nine feet deep, accommodating vessels of six hundred, and four hundred tons respectively, while the Erie still remains only seven feet deep, its further enlargement, though often discussed, being difficult on account of its great length. But now a new factor in the problem of water transportation has appeared. The old freight boats have been succeeded by grain vessels of a thousand tons burden, and those ships cannot pass through the Canadian any more than the American canals. A further and uniform enlargement of the Welland and St. Lawrence Canals to a hundred feet in width and fifteen feet in depth, admitting vessels of fifteen hundred to two thousand tons, was therefore agreed to as part of the Canadian Confederation Scheme of 1867, and

has already been completed so far as the Lachine Canal is concerned. The works on the Welland will probably be finished in two years from the present time, and it will then remain to be seen whether the efforts by which the Canadians hope to divert the carrying trade of the north-west, not only from Buffalo but from New York as well, will be successful. The St. Lawrence route is open for only half the year, and the process of enlarging the capacity of grain ships is still going on, there being already vessels on the lakes above Buffalo which could not enter even the new Welland Canal; but whether Canada gets the whole or only a part of the gigantic trade she is bidding for, there can be no question that with the completion of a clear water-way for vessels of two thousand tons from Lake Superior to the Atlantic, Montreal must become a serious rival to New York in regard to the transportation of grain. The five great Atlantic outlets are Montreal, New York, Boston, Philadelphia and Baltimore, and of these New York at present receives rather more than half the grain coming from the north-west, while Montreal only handles ten per cent. of it, the remaining forty per cent. being pretty equally distributed between the three other ports. The New York traffic is partly rail and partly water borne, that of Montreal is all water-borne, while Boston, Philadelphia, and Baltimore are connected with the west by rails only. When the Canadian Pacific Railway is completed there will be

six great taps draining the north-west, a state of things which, while it warns the colony not to expect too much from its enterprising improvements in the canal system, offers a bright prospect of further cheapening the transportation of bread stuffs between America and Europe.

Lake Erie is one of the few seas which have witnessed the surrender of an entire squadron of British ships. The efforts of Napoleon in the early part of the century to exclude English exports from the Continent were foiled by the rise of a vast system of contraband trade, and by the development of the carrying trade in neutral bottoms. Anxious to prevent the transfer of one of her important industries to other nations, England endeavoured to compel all vessels on their way to blockaded ports to touch first at British harbours; and claimed the right to search vessels for British sailors, a high-handed proceeding which led to a serious quarrel with America, terminating in the war of 1812. In this contest the States were as unfortunate ashore as they were victorious afloat. The defeat of the British frigate *Guerrire* by the *Constitution* was balanced by the capture of the American frigate *Chesapeake* by the *Shannon* in Boston harbour; but the loss of this ship and the death of her brave commander Lawrence, who fell exclaiming, "Don't give up the ship," was more than avenged on Erie. There, on September 10, 1813, a naval battle took place between a British squadron of

six ships and nine American vessels, under the command of Lieutenant Perry, who sailed from the little town of Erie in the flag-ship *Lawrence*, so named after the captain of the *Chesapeake*. This ship was disabled in the fight, and Perry transferred his flag to another vessel, but in the result the British squadron surrendered, and the American lieutenant returned with his prizes to Erie. Three years later the war was ended by the Treaty of Ghent when the English claim to a right of search was silently abandoned, thanks to the exploits of the American navy.

Lake Erie opens into the small but pretty St. Clair Lake by the Detroit river, whose banks, generally covered with primitive forest, are cleared and settled all along the water's edge, and beautiful with fruit orchards, where excellent apples may be bought during the season for a shilling a bushel. The stream at the entrance of Lake Huron is almost a rapid, against which steamers crawl slowly upwards. The shores of Huron are very low and composed entirely of ice-borne drift. They are clothed with dark pine woods whose seemingly boundless extent impresses the mind with an overpowering sense of loneliness, and whose monotony is scarcely broken by "lumbering" villages, which hide among the pines, their presence betrayed only by clouds of yellow smoke hanging like a pall over the forest and adding to the melancholy of the scene.

"Lumbering" is the sole industry of these vast soli-

tudes, and is conducted in the rough-and-ready way so characteristic of American enterprise. A company having been formed, a site on the lake-shore is selected for the mills, and some square miles of timber lands, bordering on rivers or creeks debouching into the lake, are purchased from the Government. Pioneer gangs visit these "pine lands" in autumn, and establish permanent camps in favourable positions near the most important lake affluents; erecting stabling for twenty or thirty teams, and log huts for forty or fifty men. All being thus prepared, the camp is occupied as soon as the first snows fall, and felling is commenced in earnest. The fallen trees are cut into lengths, sledded over the snow to the river, and tumbled in; the mouth of the stream having first been closed by a strong boom which prevents the egress of timber into the lake. When four or five thousand pieces have accumulated behind the boom, they are formed into a raft in the following manner:—Thirty large logs, each sixty feet long, are chained together end to end, forming a string; a second similar string is then constructed, and the two are secured together by thirty cross-pieces, each sixty feet long, and sixty feet apart. The finished structure forms a floating and jointed framework, having thirty bays, each of which holds about a hundred and sixty logs; so that a raft contains nearly five thousand pieces of timber, and has a length of six

hundred, and a width of twenty yards. When one is completed the boom is removed from the mouth of the river, and a steam-tug takes the raft in tow, then the boom is replaced and the river again filled with timber.

Before following one of these great floats to the mills, situated it may be many miles away, the camp deserves a moment's notice. The lumberers are chiefly Canadians, men of magnificent physique, but not of refined habits. The hard labour, remoteness, and severe winter climate all disincline the men from cleanliness, and while in camp they never wash, and hardly ever take off their clothing. They doff their "pants" and the heavy woollen "jumper" at night, but that is all. They earn about sixteen dollars a month, all rations being found, and receive no money payments while in camp. Though strict abstainers while at work, they loaf about the village saloon all summer, and having spent their last dollars go in debt at the "store" in order to keep going until the next season's work begins. None but the strongest frames can withstand the hardships of a winter camp in these latitudes, where the snows are deep and the temperature almost Arctic in severity; but the transport of heavy logs is so much more difficult on wheels than by sleds that the business of lumbering must always remain a monopoly in the hands of a class whose physique is superior even to that of an English navvy.

Lumber-towing on the wide and stormy waters of the lakes is not free from excitement and danger, as we learned later from the narratives of our Michigan boatman, John McCarty, who was for many years in charge of a tug. This man was once caught in a sudden gale, on a lee shore, with his raft to windward of the steamer. Fearing the loss of the vessel which was rapidly drifting ashore, he determined to "jump the raft" and at the risk of entangling the screw and smashing the engines, turned the tug, and drove her directly at the logs. These were submerged by the weight of the boat, and the propeller sent the sticks flying in all directions, but McCarty ultimately cleared the raft with all the machinery sound, and only his rudder damaged. Next day he picked up the raft which, though stranded; had not gone to pieces, and towed it safely to its destination. The lake is always dotted with floating timber and the shores are lined with the wreckage of years. Sometimes a storm breaks up a raft, sometimes destroys a "boom," when hundreds or it may be thousands of logs escape. These cumber the beaches, and add to the desolation which is so marked a feature of Lake Huron scenery.

The site chosen for the erection of saw-mills is always a sheltered bay, where a kind of floating dock, made of logs chained together and secured to piles, rides on the water for the reception of the rafts. Here the tug dis-

charges its burden and then returns to camp, towing the empty framework back, to be refilled. The docks accommodate sufficient timber for the supply of the mill at all seasons, and present a really astonishing sight when full. Piers, constructed of waste wood, on a commensurate scale with the docks, are run out from the shore into deep water, forming wharves for the stacking and shipment of cut boards. The mill is erected by the lake-side, and an inclined slide-way ascends from the water to its first floor, where the saws are placed, the ground floor of the building being occupied by the motive power and driving gear. The slide-way is fitted with an endless chain, which is fed by a man wearing high boots, with corked soles, and armed with a long boat-hook. This clever acrobat walks about over the floating logs with a skill that is only acquired after repeated duckings, and punts them one by one to the foot of the slide, where they are laid hold of by hooks attached to the endless chain, and carried to the saw-benches. These machines and others which handle the great tree trunks mechanically, are excellent examples of the survival of the fittest, being entirely different from and far superior to any similar tools in this country. The work is extremely heavy, yet the logs are rapidly adjusted, almost entirely without hand labour, on the saw-benches, from each of which a stream of cut boards issues at the rate of

nearly a hundred feet a minute, or a mile an hour. A mill with two saw-frames turns out twenty million cubic feet of lumber per annum, worth £40,000 in Chicago; and lumbering, the distinctive industry of the great lakes, is a profitable enterprise.

CHAPTER XII.

MACKINAW.

June 16–20.

THE rivalry between France and England in the seventeenth century was worldwide in its extension. The two countries were neighbours in the West Indies, the East Indies, and in Africa; while in America, as we have already seen, Louis XIV. claimed sovereignty over all the known regions west of the Alleghany Mountains. French colonies had been planted in America years before the *Mayflower* anchored within Cape Cod; but France and England, rivals in the Old World, could not be partners in the New. Neither ambition nor commercial enterprise however carried the power of France into the western wilds, but the religious enthusiasm of the Church of Rome. A similar motive-power urged the pilgrims to colonize New England, and the two peoples in America were, in the first instance, parted more by religious differences than national jealousy. But a struggle, which terminated as we have seen in favour of England, was unavoidable between powers divided by so

many animosities when lust of territory and desire for commercial supremacy had taken the place of the apostolic zeal which animated the Jesuit missionaries through whom Rome, as much as France, attempted the spiritual conquest of America.

Hardly was the Society of Jesus established than it gave to the world an army of devoted Christian soldiers, who raised the cross, not only among the old civilizations of India, China, and Japan, but even on the high lands of Abyssinia, the plains of Paraguay, and the slopes of the Sierra Nevada. The shores of the upper lakes were all first explored by Jesuit missionaries, who early penetrated into the heart of the Huron wilderness, disregarding toil, hardship, torture, and death, in obedience to their vows, and at the bidding of their superiors. If these men were superstitious ascetics, at least they were Christian heroes, often Christian martyrs, and always, although incidentally, explorers. Every town of importance in French America originated from their labours, and "not a cape was turned nor a river entered, but a Jesuit led the way."

We left the steamship *Oneida* at Mackinaw, an island of many interesting memories, whence Père Marquette, one of the most distinguished yet unaspiring of these remarkable men, was long employed in extending Christianity, and confirming the influence of France in the vast regions between Lake Michigan and the head of Lake Superior, and where, spent after only thirty-eight

years of toil, his body reposes. In the spring of 1668, Marquette was sent to take charge of the Ottawa Mission, as that around Lake Superior was then called, and he planted himself at Sault St. Mary, on the American side of the rapids which connect the upper lakes with Huron. Here he was joined in the following year by Père Dâblon, and the log church and cabins built by these two, formed the first permanent settlement made in Michigan. In the same year, leaving Dâblon in charge of his Huron converts, Marquette travelled westward by Lake Superior, and having established a mission among the Chippeways on its southern shore, he pushed on to its western extremity, where he found several Indian villages, one of which was inhabited by Hurons who had lived several years before on Mackinaw Island.

Four years previously Allouez, another Jesuit missionary, had raised the Chapel of the Holy Spirit in these distant regions; and such was the power of his teaching that the scattered tribes roaming the deserts north of Lake Superior, the Potawatomies from Lake Michigan, and even the Illinois from the as yet unknown Mississippi Valley, pitched their tents around his cabin, and listened to the gospel message. These last spoke of their country, describing the noble river on which they dwelt, and the vast treeless prairies where buffalo and deer abounded. "Their country," wrote Allouez to his superior, "is the best field for the gospel;" and these letters first made the pale faces acquainted with the

existence of the great stream, which Allouez in his correspondence called the "Messipi." The missions of Marquette and Dâblon were created by this great enthusiast, who, returning from the wilderness to Quebec for a few days in 1667, pleaded so fervently with governor and bishop for the establishment of more stations, that Sault and Lapointe were occupied in the two following years, and a third still more important mission established by Marquette at Mackinaw, in 1670.

While at Lapointe, Marquette, like Allouez, heard from native lips of the magnificent open country of the Mississippi Valley; and in the autumn of 1669 he resolved on attempting its exploration, in order to carry the message of the Cross still further among the heathen. Nearly four years however elapsed before it was possible for the father to carry out his plans; but at length, in June, 1673, he started with Joliet, another Jesuit missionary, on the expedition. Leaving Lake Superior by the Fox river, they followed this stream to its head-waters, and carrying their boats across the narrow watershed separating these from the sources of the Wisconsin river, the two poor Jesuit missionaries reached the basin of the Mississippi. Launching their canoes upon the Wisconsin, the discoverers entered the great river after seven days, and floated thankfully southward nearly to the Gulf, over the vast and then unknown stream which within two centuries has become

one of the chief highways of the world. Neither pride nor ambition swelled the bosoms of these explorers, whose absorbing piety purged every earthly feeling from their thanksgivings that God had thus widened the field for the spread of His Word. Of Joliet nothing is known except in connection with this expedition. He carried the news to Quebec, and then probably returned to the obscure toils, perhaps suffered the painful death of many another labourer in this section of God's vineyard; while Marquette halted on the spot where Chicago now stands, and preached the gospel to the Miamis for another two years. Then, worn out with the hardships of life in the wilderness, he set out in the spring of 1675 to return to his home at Mackinaw; but as he coasted along the shores of the lake, his strength gradually failed. His devoted Indian companions, feeling that the end was near, entered a little creek where they built a bark cabin, kindled a fire, and laid him down beside it. After shriving his companions and commending them to God, he professed his faith aloud upon the crucifix, and thanking God for permitting him to die a Jesuit missionary and alone, he passed away with the name of Jesus on his lips. Two years later, acting under Marquette's instructions given at Lapointe, the Indians reverently transferred his body to Point St. Ignace at Mackinaw, where it lies under the solemn pines, beneath the roof of the church which he himself had raised.

The village of Mackinaw, containing five hundred souls, is redolent of the backwoods. Indian half-breeds are numerous in its streets and are not bad-looking people, the women especially having fine faces and figures, while the shops are gay with Indian handicraft. Not many years ago the Chippeways assembled here once a year to receive their annual allowance from Government at the hands of the Indian agents—a class of men who unfortunately for the relations between the red skin and the white, have often been badly chosen for the discharge of duties demanding the strictest justice. The Chippeway claims have been extinguished for some years, and a characteristic spectacle is now lost to visitors. In the old days the tribes camped along the beach, and gave themselves up for a week or more to feasting and Indian merriment. The shops of Mackinaw are tiny general warehouses, where almost everything can be bought, but the store-keeper is a very different person from the huckster of an English village. The stock though miscellaneous, is well selected, and arranged in the most orderly manner on clean white shelves which surround the shop. The proprietor is an intelligent man of some importance, living on terms of friendly equality with every one about the place. The drug store, for example, is "run" by our good friend Dr. Baily, a properly qualified M.D., a wide traveller, a good doctor, and an excellent companion; who will either prescribe for patients or retail them quack medicines as

they may desire; and who sells you an ounce of tobacco, a pound of soap, or a packet of fish-hooks, without loss of his professional dignity. His shop is a picture gallery of advertisements, and becomes a kind of club at night, where we refresh with "old rye," and discuss American politics and local history with the doctor himself and such neighbours as may happen to drop in.

The little town is dominated by a fort, which affords us the rare sight of American soldiers, whose appearance is smart and whose rifle practice is excellent. This fort was once a French post, and many an English adventurer, pushing up from the lower lakes to the upper waters in search of the furs of the north-west, left his scalp hereabouts in the hands of the savage subjects of France, to whom Jesuit zeal was trying to teach the law of love. After the question between France and England was finally settled on the Heights of Abraham, Mackinaw, together with all the French posts around the lakes, passed into the hands of the British, whose scattered soldiers, lost in the boundless woods, held these isolated spots at the imminent risk of massacre by the Indians, recently the allies of France. Such a massacre occurred at Mackinaw Fort two years after the British took possession of it, the Indians, presumably friends, having entered by stratagem, and a solitary trader alone escaping from the butchery which followed. The fort was again the scene of strife in the war of 1812, of whose naval aspects some mention has already been

made, and the spot where our troops were disembarked is still called "The British Landing."

The island became very prosperous shortly after the war, having been chosen by Mr. Astor as the base of his widespread operations in the fur trade. His company, controlling an immense capital, had outposts scattered throughout the whole west and north-west, for which Mackinaw was the central mart and depôt. Here the trappers' supplies were collected from the company's store-houses in New York, Quebec, and Montreal; and hence they were distributed to the outposts. The furs on the other hand were brought annually to the island, whence they found their way to the eastern states and to Europe. At this time Mackinaw held nearly two thousand souls, mostly Indians; but the trade declined on Mr. Astor's retirement from the enterprise, to pass at length into the hands of the Hudson's Bay Company.

We quartered at a hotel called the Mission House—in memory, not of the seventeenth-century apostles, but of the Christian work of Dr. Morse, father of Professor Morse the inventor of modern telegraphy, who visited the island in 1820 and preached the first Protestant sermon ever delivered in the north-west. Acting upon his report on the condition of the natives and traders, the United Foreign Missions Society of New York established a church and school here in 1822, but the work of religious instruction and education slackened with the dwindling population, and upon the Indians

altogether ceasing to resort to the place for purposes of trade, the enterprise was abandoned.

Once more the Romish Church is in the ascendant at Mackinaw. The Protestants are too few to support a clergyman, and we found their church dilapidated and unused, except for the entertainments of the "Caramel Minstrels," whose latest programme of comic songs was chalked on the canvas wings of a rough stage occupying the site of the displaced pulpit. The Catholic church on the other hand, built of wood, in the severest style of carpenter's Gothic, is in good repair, and evidently well attended. Our friend Dr. Baily was the only Protestant member of the village school board, yet, as we learnt with astonishment, the Catholic majority supports a conscience clause, and allows of no religious teaching in the Mackinaw schools repugnant to the feelings of parents. Thus do free institutions modify religious prejudices, and take the sting even from religious intolerance.

While at Mackinaw we hired a small yawl, whose skipper, John McCarty, as already related, saved his steam-tug from destruction on Lake Huron by "jumping" the timber raft which threatened to drive him on a lee shore. With him we sailed round the island, and explored the neighbouring shores, visited some of the great lumbering establishments, and touched at Point St. Ignace to see Marquette's grave. The fishing was excellent, and a dip, diversified with balancing feats on

the floating logs, was our daily luxury. Nothing can seem more perfectly desolate than the low, silent, pine-clad shores of the lake, with their narrow white beaches, sprinkled with erratic pebbles of granite and gneiss, and cumbered with derelict logs of timber. But once landed, the forest is not without its attractions, at least in summer. There are clear spaces among the trees where the columbine displays its symmetrical scarlet blossoms, and the smooth brown stems of the wild cherry contrast with the silver bark of the birch; but even after our most enjoyable rambles among the pines, we thought that restraint had been exchanged for freedom when the forest was left behind us, and our yawl danced again on the sunlit waves of Mackinaw Strait.

CHAPTER XIII.

CHICAGO.

June 20–27.

THE navigation of the great lakes becomes monotonous after a time, and we stepped on board the *St. Louis* steamboat at Mackinaw, bound for Chicago, disposed rather for the observation of our fellow-creatures than of nature. The general want of interest shown by Americans in Europe and European concerns had already struck and surprised me so much that I determined to test the question of its existence on the voyage. Strolling about the Treasury on the evening of our arrival in Washington, we fell into talk with a caretaker, who answered our inquiries about the building very intelligently, and appeared in other respects a well-informed man. Having satisfied our curiosity he said, "I guess you are tourists, gentlemen," to which we replied that we were from England, rather hoping that the man, who had answered so many of our questions, would ask us something about the "tight little island," if only for the sake of repaying

him for his politeness. He paused for a few moments, and then with the air of a person who feels bound to make a civil speech, said, "And *haow's* England?" If the "tight little island" had been our sick relation and a perfect stranger to him, our friend could not have spoken with more polite indifference. The tone, impossible of reproduction, pricked such a big hole in the balloon of our national vanity that we collapsed on the spot. Nothing has since occurred to reinflate us; on the contrary we have, figuratively speaking, heard so many compassionate inquiries of "Haow's England?" that we are not anxious to air our nationality.

The Americans are great European tourists, and every steamer that leaves New York is crowded with innocents going abroad, but they are for the most part tarred with the same brush. Some of them, on their return, will own to having passed over rising ground in the Bernese Oberland; while others may naively complain, as happened once in my hearing, that the Highland hotels are inferior to those of Paris, and this city therefore to be preferred before the land of flood and fell. Once in an Oxford hotel I was asked, "Do you think I might shunt York Minster on my way to the north? I have seen everything here, and the English antiques are so much alike that I will lump them, and save a day, if you so advise." Willing to believe that these were exceptional cases, I began my search for a fellow-passenger with a genuine interest in the Old

World, but found none. For Americans generally England is the country of Shakespeare and of some interesting "antiques." Paris, the Yankee heaven, is the beatified home of Worth and the birthplace of beautiful jewellery; while the balance of Europe is either a great *bric-à-brac* shop or a playground. The night of the Middle Ages, the morning of the Renaissance, the strife of peoples with priests and kings, the birth of free institutions, and the growth of nationalities, are naught in the ordinary American's valuation of Europe. Only the history of states, where men are born free and equal, is of any real human interest; the rest is sound and fury, signifying nothing. I do not think I overstate the case, and there is something to be said for this view. Human energies have necessarily been, as they still are, recklessly squandered on stupid issues in the European struggle for liberty. It is heart-breaking to sum the waste of courage and genius which has accompanied the evolution of humanity in the Old World. But while we crown with bay the heroes of freedom's battles, America is placed where the valour that we rightly honour, and its needlessness, are both equally conspicuous. Whatever the reason, there is very little interest felt in the New World for the Old; but there is a great deal of confidence in the superiority of America to Europe in all respects.

There is less small-talk among Americans than with us, and conversation is commonplace, solid, and argu-

mentative. Men rarely speak about subjects with which they have not considerable acquaintance, but they are fond of discussion, which is conducted fairly and without heat. While making use of extravagant hyperbole to illustrate a position, they avoid all injurious expressions, and try to establish their points without appeals to prejudice, and without personality. They state a case slowly, listen to the other side patiently, and attach much weight to conclusions arrived at by the reasoning process. Prejudice, tradition, and custom are powerful dictators of opinion in Europe, and too often colour our convictions; while the deadly character of competition in a crowded country lends bitterness to every conflict which touches vital interests. In the States on the other hand, the competitive struggle is not *à outrance*, and the freedom of the career, developing individual character to an extraordinary degree, strikes off many fetters which bind thought in Europe.

The first white man to visit Chicago was Marquette, who preached the gospel there to the Miamis on his return from the discovery of the Mississippi in 1673. No settlement took place until 1804, when the United States Government built a fort; but this was abandoned in the war of 1812, and finally demolished. The first house was built in 1832, when Chicago numbered only a hundred souls. The first vessel entered the harbour two years later, and the first official census, taken in 1837, showed a population of four thousand inhabitants.

Forty years ago the site of Chicago was rolling prairie, covered with tall grasses, wild marigolds, and sunflowers, the haunt of the buffalo, and the home of the Indian. Thirty years later a busy city of three hundred thousand inhabitants stood on the same spot, but was suddenly swept out of existence by a great fire in 1871. While we in England feared that Chicago had received a mortal wound, the young athlete had but tripped for a moment in that arena where, though the struggle for existence never ends, the survival of the fittest is assured; and in the result the spot has proved to be the natural centre of the American grain trade, while now, only ten years after its practical annihilation, the city contains more than half a million inhabitants. The wooden shanties of 1871 have given place to warehouses and stores which remind the English visitor of Cannon Street or Queen Victoria Street. Great industries connected with the food supply of the whole world have arisen, and ministering to the wants which these create, a multitude of manufactures have clustered around the central interests. Stately public buildings serve the municipal wants of the city. Bold engineering works bring a splendid water supply through several miles of tunnel, from the purer depths of Lake Michigan. The private houses of wealthy merchants and manufacturers—palaces such as the American architect delights to rear—adorn the environs. Lincoln and South Parks, rivalling anything of the kind in Europe, lie one on

either side of the city, which will soon be girdled by thirty miles of leafy boulevards.

The middle states of America, now no longer appropriately called the West, were almost untapped in 1850, and the heart of the continent, containing millions of square miles of fertile soil, was waiting for the plough. An immense commerce, for the control of which older cities were reaching out their hands, was about to flow from these hitherto unoccupied lands. Where should it find its centre? The situation of Chicago destined it for this position. Standing at the head of Lake Michigan, it commands the inland navigation, and its early citizens soon supplemented their natural advantages by the construction of railways in all directions. Thus placed, with the agricultural states of Ohio, Illinois, Iowa, Indiana, and Wisconsin at her back, with an uninterrupted water-way and direct railways connecting her with the seaboard, Chicago forms at once the natural focus for the productions of the middle states, and the point whence grain, cattle, and hogs are distributed to the populous Eastern states and the markets of Europe. It also receives from the pine forests of Huron vast quantities of timber, which find their way either to the Southern cities and plantations, or to the ever-spreading emigrants of the treeless western prairies. The Chicago river is lined for seven miles with lumber yards, witnessing even more powerfully than the grain trade itself, to the energy of the city. For the corn

which Chicago distributes is grown almost at her gates, but the forests of South Carolina are nearer the Southern markets than the pines of Huron ; yet the business men of Chicago have created facilities for the distribution of timber which neutralize the natural advantages in favour of their Southern competitors. Within another thirty years Chicago may rival New York. There is room on the American continent for many capitals, and the Atlantic cities do not perhaps derive more importance from their manufacturing enterprise and command of European markets, than the Queen of the Middle States will shortly acquire from the rapidly increasing wants of the vast internal territory over which she rules.

Naturally enough, the city bears traces of its rapid growth. The great piles of handsome buildings are hustled by wretched little wooden houses. The side-walks are for the most part of planks, laid in a series of ups and downs, and so badly constructed that the loose boards often tip under the weight of the passer-by. The roads are dirt-beds, not yet filled up to the level of the side-walks—sloughs in winter, and full of holes in summer. Open spaces, full of rubbish, and detached shanties are common in the best parts of the town, while the side streets are built almost entirely of wood, and are full of beer saloons. Altogether, Chicago is a city of contrasts, and the traveller's estimate of it will vary enormously according to his point of view.

The prosperity of the Queen of the Middle States

rests on her trade in hogs, grain, and lumber, and so characteristic are the two former industries that no one can be said to have seen Chicago who has not visited one of the packing houses and a grain elevator. Of the former there are thirty-five, with a capacity for killing and curing which varies from a hundred hogs a day in the smallest concerns, to ten thousand a day in the largest. The total number of hogs killed in a year is upwards of five millions, and the average weight of each pig being two hundredweight, about fifteen hundred tons of pork a day, or half a million tons per annum, issue from the united doors of the Chicago packing houses.

In the agricultural states of the West, Indian corn is the staple crop. It is grown in vast quantities, and not being a breadstuff, is most profitably exported as pork. From a group of states therefore covering an area larger than England, streams of corn-fed hogs flow steadily to Chicago. Here they debouch into the "Stockyards," immense enclosures for the reception of all kinds of live stock, occupying an area of nearly three hundred and fifty acres, with a capacity for holding two hundred thousand animals of all kinds. Around these spacious reservoirs of human food the packing houses have arisen. Externally they are like great factories, but each is connected with the stockyards by an inclined roadway by which the hogs enter the building on the first floor. The incline leads to a pen within the packing house.

where, among some hundreds of snuffing pigs, stand two men, almost naked, their bodies covered with filth from contact with the great unwashed. Over their heads is a simple railway, composed of a single bar of iron set edgewise, and provided with rollers which act the part of carriages. The rail is continuous throughout the whole length of the building, falling by gentle inclines from one end of it to the other, and serving to carry the carcases throughout their journey from pig to pork. Above the pen and railway there is a steam hoist controlled by an attendant, who in the first instance lowers a chain to the men below. They in the meantime have secured a victim from the crowd of pigs, and one of his hind legs is fastened by a spring clip to the dangling end of the chain. In a moment the hog is lifted into the air, screaming and kicking violently, and in another he hangs head down from one of the roller carriages, while the chain falls back into the hands of the penmen. Loudly protesting, the hog rolls smoothly down the descent of Avernus until he reaches the executioner, who awaits him standing alone in the middle of a pen much like the one above. This man also is nearly naked, befouled with mud and bristle like his fellows, and in his right hand gleams a short curved knife sharp as a razor. With a swift and apparently effortless turn of the wrist, he cuts the throat of the helpless screamer, who then continues on his way, silenced but still kicking, until he reaches the lower side of this chamber of

horrors, which is closed by a sliding door. When a dozen carcases have accumulated, the door is opened, and the group roll forward until they hang over a large tank of boiling water, when the clips are tripped, and the hogs plump down into the hot bath, rolling about like porpoises, with their round backs only above the surface. After scalding they are lifted out on to a long, narrow, sloping bench, the upper end of which is occupied by an ingenious shaving machine, consisting of four drums, armed with revolving spring razors, so arranged that a pig passing through the system is shaved on four sides of a square, into which sectional figure the soft body is approximately squeezed during the process. A large portion of the hair is thus removed, and the rest is taken off by hand. Below the shaving machine the bench is occupied by ten men, five on either side, standing a few feet apart who, as the hog passes rapidly from one to another, remove more and more bristle, until he finally reaches station number five perfectly white and clean. Here the head is severed from the body, and thrown on one side as refuse. The trunk is once more hitched up to a carriage, and rolls forward to the disembowelling room, whose arcana are perhaps better left undescribed, and thence it presently issues, a spotless and attractive object, like that to which our own butcher complacently draws attention as "prime country-fed pork."

The hog now makes a long excursion to a distant

we have hitherto seen him, and here while still hanging, he is split in two with an axe, and the halves, as they accumulate from the fast-flowing stream of carcases, are rolled away in batches to the ice-house. All the animals slaughtered on one day remain in the cold chamber until the next, when the stiffened halves are brought out and severed by swift and accurate blows of a heavy axe into hind quarters, fore quarters, and sides. These are then taken to the trimmers, who artistically shape hams and shoulders, cut out ribs and spare ribs from the flanks, leaving flat sides of bacon. The trimmers' waste slips through shoots into a room below, where it is at once manufactured into brawn and Bologna sausages. The joints meanwhile descend by other shoots to the pickling department, where the shoulders and spare ribs are packed at once in barrels, which are afterwards injected with fluid pickle at a high pressure; while the hams and bacon are first allowed to lie for some days in dry pickle in a cold room, and then packed, the former in canvas bags, the latter in strong wooden cases, for the market. Such are the operations of a packing house, one of the largest of which occupies fourteen acres of land, contains sixty-four acres of floors, kills ten thousand hogs daily at certain seasons of the year, and employs more than two thousand hands!

The putrescible refuse produced in the packing and slaughtering houses of Chicago amounts to more than two hundred tons daily. This is converted into artificial

manure by cooking and drying; and the business of "rendering" the offal into fertilizer was carried on, until the last few years, in so careless and unscientific a manner that Chicago was nearly poisoned by the noxious gases generated in the process. Early in 1877 however Dr. Oscar Wolff, a man of great energy, was appointed Health Commissioner, and backed both by municipal authority and public opinion, he determined on a thorough reform in the conduct of this industry. Means for abating the nuisance having first been devised, he tried to procure their adoption, but the offenders, wealthy and powerful corporations, were obstinate in their resistance to reform, and it was only after many failures and in face of great difficulties that Dr. Wolff succeeded in establishing the legal claim of the municipality to control the operations of the packers. A test case, which was vigorously fought right up to the supreme court by a determined combination of capitalists, was finally won by the Commissioner, and notice was given to the houses that unless the nuisance was forthwith abated, the Board of Health would seize and close every one of them. Once defeated, the packers showed the true American spirit, setting themselves heartily to work to apply and improve upon the suggested remedy, with the result that a system of rendering has been introduced which, working under strict municipal supervision, has completely cured the evil, with advantage to all parties.

Originally the offal was cooked in iron tanks by

steam, at a pressure of forty pounds to the square inch, and the fetid gases generated during this process were allowed to pass directly into the open air. After eight or ten hours the tank was opened and the material drawn into wooden vats, where the fat was skimmed, the water drained away, and the solid remainder then transferred to the dryer. This consisted of a revolving cylinder, thirty feet long and three feet diameter, furnished with stirrers attached to the axle, and heated by a current of hot air passing through the chamber. Large volumes of noxious gases were generated in this process also, and when Dr. Wolff took the matter in hand, the atmosphere of Chicago had become almost unbearable.

Now, both cooking and drying take place in closed vessels, and the gases evolved, having first been drained of their watery vapour by condensation, are carried in pipes to a tank partially filled with gasoline, whence, charged with highly inflammable hydro-carbon vapour, they flow over the coal-beds of the furnaces, and supply additional heat to the steam boilers. In some cases a portion of the carburized gas is made use of to light the factory as well.

Chicago's facilities for the grain trade are probably unequalled in the world. There are nineteen grain elevators in the city, having a total warehousing capacity of sixteen million bushels, and handling yearly nearly one hundred and fifty million bushels. These buildings may be considered as great collections of corn-bins, provided

with apparatus for receiving, unloading, and reloading ships and railway cars. We visited one of the largest, and found a very ugly wooden structure, about three hundred feet square and a hundred and thirty feet high. Two receiving and one discharging lines of railway run through the house, the former in the centre, the latter on one side of it. Ten cars, each containing five hundred bushels of grain, can be unloaded at the same time, an operation which occupies six minutes. The trucks are cleared by mechanical scoops, operated by a quick-running windlass, and the grain falls from the truck into a pit, whence it is lifted by revolving buckets to the top of the house and discharged into a weigh-bin. As each car is emptied, the scoopmen telegraph the fact to the men above; the weight of the grain is ascertained and registered, together with the number and invoiced load of the car, and the contents of the weigh-bin are then spouted into a suitable store-bin. In discharging, the grain runs down wooden spouts, either into railroad cars or into vessels berthed in the basin adjoining the building. It takes twenty-five minutes to weigh and load five thousand bushels of wheat into trucks, but in the case of shipments a cargo is weighed and made ready beforehand, and half a dozen spouts fill up a vessel of ordinary capacity with some sixty thousand bushels in two hours and a half. The elevator we saw, though not the largest in Chicago, could receive a hundred and thirty thousand bushels and discharge a hundred thousand bushels

a day. The mercantile operations of the grain trade are much facilitated by a system of State inspection and "grading." A certain number designates a certain quality of any given cereal, and the Liverpool merchant, who, for example, buys "No. 3" winter wheat, or "No. 2" barley, knows exactly what will be the character of the cargo forwarded to fill his orders.

The dining-room of the Grand Pacific Hotel was tenanted during one evening of our stay by a large party of Sioux Indians, returning to the Dakota reservation with their children, who had been educated in the schools of the east. They were clean, good-looking men, well dressed, for the most part in European clothes, and the young fellows who were going back to the wigwam were very pleasant bright youths, glad to be once more among their own people. None of the seniors could speak English, but the Indian agent who had charge of the party translated some of their names, which always refer to some incident in the life of each man. Among them were the following:—Jumping-Thunder, Poor-Wolf, Son-of-the-Star, He-Bear, Runs-after-the-Moon, Cloud-Bull, White-Cow, Passes-the-Evening, Red-Dog, Spotted-Tail, White-Thunder, Black-Crow, Iron-Wing, Two-Bear, Big-Head, Thunder-Hawk, Bull-Eagle, Brother-to-All, Medicine-Bull. There were several squaws with the party, who were not handsome, and some of the men had such feminine faces that we should not have suspected their sex but for their costume.

Base-ball is an American's cricket, and being anxious to see how it is played, I attended a match between the Troy and Chicago Clubs, each represented by a crack team. The game is something like rounders, and not so scientific as cricket, but a very manly form of athletics nevertheless. I was much struck with the contrast between the spectators present, and those to be seen at a good cricket match in England. There were few ladies, and the following notice, which I copied from a placard conspicuously displayed on the walls, will perhaps illustrate the difference to which I have alluded more perfectly than I could describe it:—"The umpire is not to be hissed, insulted, or have any indignity offered him by the spectators. GENTLEMEN will, and others must, be guided by the above hints." This would read oddly at Lord's; but there were a good many "others" among the gentlemen on this occasion, and no doubt the Chicago Base-Ball Club knows its business.

There is a book store at Chicago which must, I think, be the largest retail bookseller's shop in the world. Certainly there is nothing like it in London, whether for the amount or variety of its stock of high-class literature both native and foreign. Its existence literally speaks volumes for the intelligence of Chicago, as do the several excellent literary journals published in the city; and I learnt from Mr. Jansen, the cultivated proprietor of the store in question, that there is immense literary activity existing here alongside of the earnest

pursuit of wealth. While I was talking to this gentleman one day, an incident occurred which illustrates Western freedom, or as we should call it, Western impudence. The newsboys peddle papers unchallenged in the halls and corridors of hotels, and even inside the shops, of America, and a very dirty street arab came into Mr. Jansen's store pressing his wares obtrusively on customer after customer, perambulating the large and handsome hall as if it were his own. Mr. Jansen stood it for some time, and at last in the gentlest manner ordered the boy out, whereupon the young ruffian turned on him like a tiger, showed fight, and in violent language refused pointblank to stir. I came very near boxing the impudent young rascal's ears; but Mr. Jansen only followed the custom of his country in treating the trespasser with what seemed to me absurd forbearance.

The American system of fire alarm is interesting and has been brought to great perfection in Chicago. The city is divided into districts each of which is provided with one or more fire stations, or as we should call them, fire-engine houses, while alarm boxes to the number of five hundred are distributed throughout the city, being usually attached to lamp-posts and conspicuously painted. Each box presents a crank-handle to the public, upon turning which a bell rings, and the number of the box from which the alarm proceeds is recorded on a Morse printing instrument at a central station. On receiving such a warning, the central station

calls all the fire stations, whether one or many, situated in the threatened district, giving the number of the box from which the alarm proceeds. If the fire gains ground and additional help is needed, the central office is notified from the nearest box, and the engines of a second or even third district are called in the same way as the first. The fire-engine, team, and firemen are always ready to start. From the ceiling of every station a complete set of harness hangs, provided with hinged collars, which close with a snap, the whole being tilted up on one side so as to admit the horse to his place. The same electric current which sounds the gong unlatches the doors of the stalls, and the horses trot instantly to their proper positions; the swivel harness is tilted over their backs, the collars clasped and they are ready to go. Meanwhile the driver climbs to his seat, and on his pulling a cord hanging from above, the street doors fly open, while the act of starting opens a gas-tap and sends a rush of flame into the fire-box, lighting a fire already laid; the same action shuts the taps of a circulating system which keeps the boiler full of hot water while standing; and the first pull on the reins releases the harness from its ceiling supports. In the next moment the engine is sailing away at a gallop, getting under way in twenty seconds in the day-time, or thirty seconds at night.

At one salvage station in Chicago where there is

only a waggon, the men get out in five seconds, night or day; indeed they can do it quicker at night. In this case not only are the horses released by the alarm current, but the same agency pulls the coverlets off the firemen's beds, opens trap-doors in the bedroom floor, and lets fall slides, through which the men slip direct from their beds into the waggon. There are two drivers, and the man who is first on the box, takes up the reins, while the second draws on his "pants" and boots, lying ready one inside the other on the seat. This done, he takes the lines from No. 1, who pulls on his boots and "pants," so that half a block is sometimes covered before the second man has dressed.

By the kindness of "Fire-Marshall" Sweeny we saw the system in operation, and verified with our own eyes and watches the surprising times given above. At one moment the whole building was wrapped in apparent repose. The waggon-room was silent and deserted, the horses were shut in their stalls, while upstairs, eight active fellows feigned sleep under the bed-clothes. Suddenly a gong gave one loud stroke, and as if by magic, the team appeared in place duly harnessed, the coverlets flew to the ceiling of the bedroom, whose floor yawned and swallowed the men as they rolled from their beds into the shoots. Before the Morse instrument had finished printing the number of the box from which the alarm proceeded, before the last reverberation of the

gong had died away, the waggon was tearing along the street at a furious gallop, the whole thing having occupied less than five seconds.

America is a great solvent of nationalities. Even the stiff-necked Englishman becomes Americanized in time, while the adaptive German is soon absorbed. Chicago is full of Germans. There are whole streets where the names over the shops are without exception German, and the city is crowded with lager beer saloons, kept by Germans, and displaying German signs. Yet, saving his love for the beer-garden, the Teuton loses all trace of his origin within a few generations in the States, becoming thoroughly American not only in speech and manner, but even in appearance; and it is striking to feel oneself, as happens in many parts of Chicago, in a German town, and yet hear nothing but English spoken.

The banks of Lake Michigan are low and flat, and the surroundings of Chicago have a melancholy air. Michigan Avenue, the plutocratic quarter, lies partly on the lake, and contains some magnificent houses, among which is a palace of Mr. Pullman's; but while the architecture of these wealthy homes, sometimes classic, sometimes Gothic, sometimes Romanesque, has a certain charm, an Englishman always feels surprised at the smallness of the grounds surrounding great houses in the States. Gardening certainly is not a national taste in America.

Chicago was originally built on a swamp, and had no proper drainage either into the lake, or the canal which connects the Chicago river by way of the Illinois with the Mississippi. When the question of sewerage became urgent it was proposed to raise the whole city twelve feet above its original level, and this bold proposition was actually carried out. Great stores, warehouses, hotels, and private dwellings were jacked up and removed, sometimes long distances from their first sites, business being carried on as usual during the operation. Even now it is not uncommon to see a house travelling slowly along one of the less crowded streets, with chimneys smoking, and perhaps even the piano going. We met two such phenomena during our stay; and nothing that we *saw in Chicago so forcibly* reminded us at once of the energy of its early citizens, and the marvellously short career of a city which was an ash-heap ten years ago, and is the rival of New York to-day.

CHAPTER XIV.

EN ROUTE FOR THE ROCKY MOUNTAINS.

June 28-30.

THE traveller going west from Chicago may choose between three railroads, which run in parallel courses from the capital of the central states as far as the Missouri river. Each of them "touts" vigorously for custom; their rival time-tables are illustrated works of fiction, and they all advertise the addition of a comfortable dining-car to the usual Pullman "sleeper"—a novelty which on these long journeys is very agreeable, not only from a hungry man's point of view, but because it furnishes a means of whiling away time that might otherwise hang heavily.

The trip from Chicago to Cheyenne, where we made our first halt, occupied two days and two nights, but we certainly were not dull on the road. When tired of our books and easy-chairs, we lounged on the platform, smoking, chatting, and viewing the country, or strolled through the train and amused ourselves with the varied groups of passengers. Here was a knot of Chinamen going west, or a couple of blanketed redskins; there a

flaxen-haired family of Scandinavian emigrants, or a party of Irish exiles. When tired of talking to one or another of these groups we had a rubber; or if night were falling, watched the clouds aflame with the fiery colours of a prairie sunset; while a good bed and the dining-car supplied us with ample material comforts. Nor were our mental wants neglected by the newsboy, who not only peddled papers, pea-nuts, candy, and cigars, but plied us with copious cheap literature both heavy and light.

The American reprints of our best contemporary authors are very tempting ware. Not only can all the best and worst novels, from George Eliot to Ouida, be bought for from fivepence to tenpence apiece, well printed, on excellent paper; but such books as the "Memoirs of Madame de Rémusat," Justin McCarthy's "History of our own Times," and Matthew Arnold's "Wordsworth," are offered at similar prices in the "Franklin Square Library," published by Harper Brothers. The question of international copyright is a delicate one to discuss with Americans, as indeed would be the proprietorship of your own handkerchief with a pick-pocket; but the subject is capable of original treatment, and was recently placed in quite a new light by the *New York Herald*. "We believe," says Mr. Bennett's paper, "that the absence of an international copyright is more widely regretted in this country than in England, though for a different reason. People

lament that this system makes cheap such trash as Wilkie Collins,* and makes dear those good books which can only be purchased in an English edition; while it well-nigh arrests the literary activity of this country. The land is flooded with foreign thought, and consequently dwarfed in all that part of its intellectual activity which would choose to manifest itself in literature. If American literature were protected by a copyright law which would compel proper remuneration to foreign writers, this would be otherwise."

Although the *Herald*, being furious against Mr. Wilkie Collins, is more anxious to say something offensive about his works than to elucidate the question of international copyright, this remarkable utterance is worthy of a moment's consideration. It certainly is not complimentary to the literary activity of America to say that it is arrested by the widespread publication of low-priced English "trash;" yet this is the writer's position, for he tells us that good or thoughtful books are not cheaply reproduced, but must be bought in dear English editions; while in the same breath he declares that native ideas are swamped in a flood of foreign thought. The *Herald*, being angry, forgot that some of the best contemporary English literature is reproduced in a cheap form side by side with the "trash"; witness

* It is only fair to Mr. Collins to say that the article from which I quote was written in reply to some excellent if severe remarks of his on the question of international copyright.

the examples I have already given: but thoughtful books like these, sown broadcast throughout the States, ought surely to stimulate rather than drown the literary activity of the country. It is not disgraceful for America to admit, what the catalogues of her publishers silently proclaim, that she has not yet become a literary nation, but it would be more dignified if she paid for the "foreign thought" she now steals, instead of accusing it of dwarfing her literary energies. The Americans are not only greedy readers, but great buyers of books. The circulating library which fosters the production of "trash" in England, is happily unknown in the States, and its place is taken by the issue of large low-priced editions. Book-buyers are critical readers, and the American system encourages a habit of judicious selection; while the circulating library lowers literary taste and checks the formation of private collections of books.

Leaving Chicago, the train enters at once on the prairies, which, though they appear level, are low, rolling hills of drift. These were formerly covered with buffalo grass and flowers, but the first has been almost entirely replaced by cultivation, while the sunflowers and marigolds fringing the sides of the track, are all that remain of the last. On either side of the railway a wide, well-farmed, undulating country, and far-reaching views, remind the traveller of the Lothians; while the fields are green with oats, and the lush foliage of Indian corn. Here and there stretches of prairie grass occur, which,

diversified as they are with groups of oaks, give a park-like appearance to the scenery; but the prairie becomes quite treeless about fifty miles beyond Chicago.

The prairies form probably the most important natural feature of America, for in them is centred her great agricultural wealth. They are vast natural meadows, sometimes hundreds of miles in extent, having a deep soil of great fertility, with scarcely any exposures of the underlying rocks. The whole of America between the Alleghanies and the Rocky Mountains is a flat depression, occupied as far south as lat. 40° by the glacial drift which remained after the ice age had passed away. This drift covers the feet of the Rocky Mountains, and forms great shoulders on their flanks, whence it slopes gently to the valley of the Mississippi; while a similar slope extends from the western side of the Alleghanies to the "Father of Waters" which occupies the middle of the continent, and carries the drainage of its central depression to the Gulf. The drift of the Mississippi valley is overlaid by the "bluff" formation—a thick widespread deposit of fine adhesive yellow loam, or loess, obscurely stratified, and derived from the muds of the shallow inland seas which covered Central America after the close of the glacial period. This material is easily dug by the spade, but resists atmospheric influences so perfectly that walls of wells and railroad cuttings stand like masonry. Where the loess has been excavated by rivers, the banks have cliff-like

sides, sometimes more than two hundred feet in height, which rise so steeply from the water that a man cannot climb them, although they have no rocky framework and are destitute even of pebbles. These thick beds of finely comminuted soil cover vast areas, sometimes hundreds of miles across; they form the arable land of the great corn and wheat growing states, and constitute the finest farming region in America; the heart of what is at present the granary of the world.

Good land and plenty of it—not manufacturing skill or supremacy—is the true secret of America's prosperity. Four-fifths of her total exports consist of raw materials and food stuffs, and nearly one-half of them are food stuffs alone. If we as free traders are right in believing that her methods of fostering manufacture are mistaken, it is fortunate for the States that such a policy affects only one-fifth of her whole turn-over. There is still more than twice as much unimproved as improved land in America; and her land legislation is in strong contrast with her industrial policy, being wise and liberal instead of short-sighted and reactionary. Under the free homestead law, every naturalized citizen of the United States can have a farm of a hundred and sixty acres without charge, solely upon condition that he puts a specified amount of work into the land within a given time; and after the law has been complied with in this respect, he may if he pleases "pre-empt" a second hundred and sixty acres at an almost nominal price per

acre. Favoured by such an Act, men with little capital, and even very poor men, can become proprietors by hiring themselves out during the busier agricultural seasons at the high wages prevailing in a country of few labourers, and working on their own homesteads in the remaining months of the year. There are two and a half millions of farms in the States, many of which have been acquired in this manner; and the effect of the homestead law is to turn industrious emigrants into proprietors, instead of allowing them to remain labourers, to the disadvantage of State and individual alike. In the four great farming states of Illinois, Indiana, Iowa, and Ohio, there is only one labourer to every four farmers—a state of things which stimulates personal energy and develops character in a remarkable manner, and a consummation devoutly to be wished in the British Islands. For this question of tenant *versus* proprietor is becoming the *crux* of English agriculture in face of the ever-increasing American competition. We alone of all nations retain a modified feudal system, with the result that the condition of the English agricultural labourer is a disgrace not only to our Christianity but to our commercial insight. During the year 1880, just half a million pairs of hands poured into the United States, and the greater part of them found their way to the land. If American law did not encourage proprietorship and discourage tenancy, these emigrants would remain only labourers in exile; but instead of this

they become land-owners, and in the act of extending the cultivation of cheap land, strike blow after blow at the prosperity of English agriculture. There is no surplus land in England, but that is no reason why law and custom should both try to diminish the number of English land-owners. We cannot give our labourers homesteads, but we can free the land, and leave the rest to the action of time and natural laws.

The trains of all the three competing lines arrived at Council Bluffs, the terminus of the Chicago and Rock Island Railway, within a few moments of each other, after a run of nearly five hundred miles. We gave ourselves an excellent farewell dinner in the travelling restaurant, and toasted the sentiment heading its *menu* in a bottle of Perrier-Jouet—

> "Whizzing past the station, rattling o'er the vale,
> Really this is pleasant, dining on the rail."

The Missouri is a wide, turbid stream of yellow water, flowing between high bluffs of loess, far removed from its existing bed. It is crossed by a beautiful iron cobweb, rather than bridge, and on the farther side of the river the Union Pacific Railway receives the passengers for the transcontinental journey. This road follows the valley of the Platte, an affluent of the Missouri, for nearly three hundred miles, over level country skirted on either hand by rolling prairie. The Platte was probably a vast stream when America was emerging from the melting glaciers, and its old banks

form remote bluffs on each side of the present river. After crossing the Missouri, the train enters the state of Nebraska, throughout whose eastern half cultivation steadily declines, and whose western moiety has all the appearance of a desert. The rainfall is very unequally distributed in North America, varying, in regard to the line of our route, from an ample supply in the eastern states, to zero in Colorado. The prevailing winds blowing from the Pacific are westerly, but their moisture falls chiefly on the Sierra Nevada, only a little of it reaching the Rocky Mountains, and none passing further eastward. The Atlantic moisture on the other hand penetrates beyond the low barrier of the Alleghany range, and is strongly reinforced by evaporation from the great lakes, whose vapours supply rain to and beyond the middle states. The western half of Nebraska however, together with Wyoming and Colorado, has an almost rainless climate, and the soil can only be cultivated by the aid of irrigation. It is believed that the moisture belt has followed the railway, or rather the westward extension of cultivation to which the railway has given rise, and much is expected from the further planting of trees. Grants of land in the arid district are made both by the State and the Union Pacific Railway, on conditions of tree culture, but it seems very doubtful if any expedients short of irrigation, will avail for the successful prosecution of agriculture in so dry a region.

Western Nebraska and Wyoming are now and will

probably always remain, cattle-raising states. The soil, though so parched, produces nutritious dwarf grasses, formerly the food of the buffalo, who lived in vast herds among the natural meadows bordering the feeble prairie affluents of the Platte. The wasteful Indian and indiscriminate slaughter of these animals for the sake of their skins, have almost exterminated the buffaloes, but their place has been taken by tens of thousands of cattle, which graze summer and winter on the prairie grasses both on this and the further side of the range. The winter snows, though sometimes deep enough to be fatal to sheep, do little harm to cattle, which thrive and multiply without attention of any kind and without artificial shelter. "Wyoming," said a ranchman with whom I fell into conversation in the train, "is God's own footstool for cattle." Once a year there is a "round up," when the beasts are driven by mounted stockmen into great corrals, or enclosures; part of the stock is selected for sale, and the calves, running beside their mothers, are branded with the distinctive mark of each proprietor: after which the herds are again turned loose, animals which cannot be definitely claimed by any one being divided among the ranchmen. Cattle-raising is a profitable business, and is pursued by many Englishmen who like the sporting character of the life, and think it more befitting a gentleman than commerce or agriculture.

We were sleeping when the train passed from the

cultivated into the uncultivated portion of Nebraska, and awoke to find ourselves surrounded by a yellow brown desert, stretching in all directions to the visible horizon. Here and there were villages of the marmot-like prairie dogs, who sat up on end and watched the passing train, or bolted into their holes at our approach. Scattered tufts of sage brush abounded, together with a dwarf pear-shaped cactus, with a large and beautiful yellow bloom. Game of all kinds was conspicuous by its absence; instead of herds of buffalo and deer, we only saw one antelope. But a strange spoor puzzled us for a long time. Every here and there, beaten tracks radiated from the telegraph posts, while a close inspection showed that many of the posts themselves were rubbed smooth up to a certain height from the ground. After many guesses we concluded that the cattle "bless the Duke of Argyll" on these rough masts, and even learnt that the beasts are dainty in their choice, for the smoothest tree-stems were always selected, and those having projecting knots, however small, avoided.

I was not much impressed with this portion of the Union Pacific Railroad as an engineering work, and presume that the constructive wonders, of which we hear so much, will be found hereafter among the mountains. The line is straight and nearly dead level for hundreds of miles. The loess forms a good natural road-bed, upon which the sleepers are laid down without preparation of any kind, and the rails are simply

secured with hooked spikes. There are very few bridges west of the Missouri river, the prairie affluents of the Platte being few, and usually small enough to be crossed by culverts. The line is unfenced after leaving the cultivated country, and the train clears the track of cattle by means of the whistle during daylight and the cow-catcher at night. The depôts are rough wooden houses, usually accompanied by a few tiny shanties, which from want of wood in this treeless region are often made entirely of old sleepers daubed with mud. These are the desolate homes of the well-tenters, or men in charge of the windmills and pumps which furnish water to the locomotives from wells bored through the drift down to the bed-rock. The road rises imperceptibly from the Missouri Valley to an elevation of five thousand feet at Sidney. Here the snow, of which little falls even at this elevation, drifts into depressions, crossing which the rails are protected by snow sheds; rough lean-tos of boards and posts, like the first stage of a child's house of cards. The old emigrants' road follows, like the railway, the level bed of the Platte, and is almost always in view from the train. We passed many waggon teams during the day, and saw many camp fires at night, never without thoughts of the early pioneers who were spent by the thousand toils and dangers of the desert, for the advantage of those who now follow them luxuriously in a Pullman sleeping-car.

The air of the prairies is indescribably pure and

exhilarating. The sun sets dressed in garments of scarlet and gold such as he never wears in Europe, and for a few minutes before his departure all heaven is aflame; but no sooner has he fallen below the horizon than the shadows of night descend, and the chill of winter succeeds to the heat of day. On the first night of the trip we were awakened by a prairie thunderstorm. No rain fell, but the lightning flashed so quickly that at no time could I count more than four or five between the discharges, which for the most part were quite continuous; while the thunder sounded as if the train were being smashed to atoms. Next morning, the sun being hot and the air clear, we saw a great deal of mirage. The high bluffs of the old river-bed seemed to become islands, lying in wide spaces of silver grey sea and receding to enormous distances: the last effect was a purely subjective one, for as the pseudo-islands returned to their true forms, their real distance became apparent.

How we lamented the late dining-car while travelling on the Union Pacific Railroad! Three times a day the train stops for meals at "eating stations"—a most fitting title for what are in no sense refreshment-rooms; and a medley crowd of human beings, clad for the most part in brown holland coats, or "dusters," rushes tumultuously into the tepid saloon, while the engine blows off steam with open throat, and gongs are clashed as the signal that food is ready. All the world is hungry and dirty, but there is no time to negotiate for a sprinkle from the

hose with which the car reservoirs are filling, so we jostle, white, yellow, and red skins alike, in the ardent competition for good places and early service. Two or three dishes of tough meat—antelope is often served—and one or two sweets, eaten in haste and washed down by tea, coffee, or iced water, promote an indigestion which the best Havannah fails to allay ; and we learned at length that a store of canned meats and fruits, which the coloured attendant kindly keeps and eats for us, together with a bottle of champagne, fresh from the ice of the water reservoir, is the best substitute for the travelling restaurant.

Arrived at Cheyenne, the Rocky Mountains were in full view, but we left the train at this point, and turning south by the Colorado Central Railway, skirted the range for about fifty miles to the little village of Longmont, whence we proposed to enter the mountains, our first objective being Estes Park, the property of Lord Dunraven. Cheyenne itself, now the centre of the cattle trade of Wyoming, was only settled in 1867, acquiring almost immediately a population of six thousand souls, thanks to the operations of the Transcontinental Railway, since the completion of which the town has slightly diminished in numbers. Like all the cities of America, called into sudden existence as camps for the armies of civilization in their rapid western march, Cheyenne was once a headquarters of rowdyism, where there was a "man for breakfast" every morning, while almost every

house was a gambling den or a brothel. But Cheyenne is orderly enough now. The mining towns of California taught America how to deal with turbulent populations, and as the number of steady citizens increased a vigilance committee was improvised, who promptly hanged some of the worst desperadoes, with the effect of encouraging the others either to mend their ways or depart.

The Colorado Central Railroad skirts the Rocky Mountains closely, traversing beds of coarse drift which lie upon the hill-sides to heights of more than five thousand feet. Above these appear the higher slopes and summits of the hills, whose feet are deeply buried in the enormous masses of rubbish which have been excavated from the glens by the action of ice and shot around the base of the range, whence the plains stretch away like a boundless ocean, out of whose yellow and hazy levels rise blue hills, seamed with dark glens, rough with forests, and capped with scattered patches of gleaming snow. The route crosses some of the chief affluents of the Platte river, whose sources are the snows of the range. Such Pacific vapours as escape condensation by the Sierra Nevada, deposit their remaining moisture as snow on the Rockies, but no rain falls from them on the plains, the air sponge being completely wrung out by the mountains. The streams are used for irrigation, and the valleys of the Cache la Poudre, the Big Thompson, Little Thompson, and St. Vrain rivers, have been partially

changed from deserts into gardens by this means. Large tracts however still remain unwatered, and there are spots in the fertile areas to which water cannot easily be carried ; hence the train crosses now a wilderness, and now a wheat-field, which succeed each other like strips of cropping and ploughed land in an allotment ground. The soil, an easily worked sandy loam, lends itself admirably to the excavation of the ditches, which are cut out by a scoop-like plough, labour being too dear in America for the use of the spade. The work, though roughly done, is almost as effective as the elaborate grading of the Lombardian plains, which has cost centuries of patient labour.

Longmont is an irrigated oasis, surrounded on all sides by arid desert, and depending for its water supply on the snows of the Rocky Mountains. To-morrow we shall follow the stream that supplies its people, fertilizes its land, and waters its shade trees, into the heart of the range, whose peaks we can see clearly outlined on the evening sky across fifteen miles of intervening plain. The hills to the southward were capped with heavy thunder-clouds on our arrival and the lightning was flashing brilliantly, while a cold air sighed as if a storm were coming. "It will surely rain to-night," we said to our host. "I guess not," was the answer; "the 'Colorado zephyr' blows up most nights and there's rain on the range every day in the two summer months, but it a'n't rained any in Longmont for thirteen months,

and won't to-night." Which prophecy came true. The black cap remained firmly fixed on the brows of the hills, the breeze died out; only the high, silent lightning continued to flash incessantly long after two weary Englishmen had sought their hard but welcome couches.

CHAPTER XV.

IN THE ROCKY MOUNTAINS—ESTES PARK.

July 1–14.

THE United States present to the traveller crossing them from east to west three well-marked divisions which may be called the eastern, middle, and western regions. The first includes the Atlantic slope and Alleghany range, the latter a series of parallel ridges, nowhere more than seven thousand feet in elevation, densely wooded, and separated by fertile valleys, settled, and cultivated. The middle region comprises the great central depression of the continent, a vast basin of drift and alluvium more than a thousand miles wide, and rising gently on either hand from the valley of the Mississippi to the flanks of the Alleghanies on the east, and those of the Rocky Mountains on the west. The western division is a tangle of mountains extending from the edge of the plains to the Pacific. The eastern border of this vast assemblage of hills is usually called the Rocky Mountains, and its western edge the Sierra Nevada, but the space intervening between these two ranges is filled with rock masses

which, though broken by immense stretches of plain, are never quite detached; and American geographers now propose to designate the groups of mountains occupying Western North America as the Cordilleras, the old name of the Andes remaining applicable to the South American chains bordering on the Pacific. From the moment the traveller enters the Cordilleras from the east, he "threads his way," to use the words of Professor Whitney, the State geologist of California, "through narrow, intricate defiles, winds around or crosses over innumerable spurs and ridges, traverses narrow valleys, and occasional broad plains, the former sometimes green and attractive, the latter always arid and repulsive to the last degree. He never descends below four thousand feet above sea-level, and is never out of sight of mountains; these always environ him with thinly wooded flanks, and sterile and craggy summits, often glistening with great patches of snow, which gradually lessen as summer approaches. In the distance, these mountain ranges, behind their atmosphere of purple haze, seem massive and uniform in character; as he approaches each one, he finds it presenting some new charm of hidden valley or cañon deeply countersunk into the mountain side. As he rises still higher, he may quench his thirst at the refreshing spring of pure water fed by the melting snow above, while the grandeur of the rocky masses, the purity of the air, the solitariness and the almost infinite extent

of the panorama opened before him, when he fairly reaches the summit, leave upon his mind an ineffaceable impression of the peculiar features of our western mountain scenery. It is through and over these mountain ranges that the Pacific Railway threads its way across the continent." That portion of the Rocky Mountains lying within the limits of the state of Colorado is distinguished by the occurrence of great natural parks. Of these North, Middle, and South Parks are the most considerable, and Estes Park is perhaps the most beautiful. All of them are elevated plains, sometimes more than two thousand square miles in extent, and from seven to ten thousand feet above the sea, surrounded by the peaks of the range and watered by the streams flowing from its snows.

We left Longmont in a four-horse stage, a coach with the body hung upon leather straps, springs being useless in mountain vehicles. Our route for the first ten miles lay over the plain, irrigated here, and arid there, a chequer-board of wilderness and vegetation. At the eleventh mile we entered the St. Vrain Cañon, where at a height of four thousand feet from sea-level, the mountains themselves began to appear above the vast beds of drift which cover their feet and slope from their shoulders to the Mississippi, six hundred miles away. The word "cañon," adopted from Spanish America, denotes a river valley with steep sides, such as is excavated by running water in rainless countries where

streams originate in remote sources and have no lateral affluents. This state of things results in the cutting of deep notches instead of the open V-shaped valleys to which we are accustomed; and these notches, called cañons when large, and gulches when small, are peculiarly characteristic of the Cordillera scenery.

Our road—save the mark!—wound up, and sometimes through, the St. Vrain river, dominated on the right by high sandstone cliffs, and fringed on the left by a narrow strip of cultivated land and cottonwood trees, whose green leaves were a welcome sight after the treeless plains. "Flumes," or wooden spouts, tapped the stream here and there, and carried its fertilizing waters, by rough but often boldly conceived aqueducts, to the rainless fields of the arid desert below. Presently from beneath the sandstone cliffs the granite core of the mountains appeared and the structure of the range became apparent. Below the drift of the plains a level sheet of sedimentary rocks stretches right across the middle region of America and was once continuous to the Pacific. Through this floor the primitive rocks forming the mass of the Cordilleras have been thrust forcibly upwards, and the once horizontal strata now lie broken and tilted at high angles on the mountain sides. The sandstone cliffs in the St. Vrain Cañon are the edges of such uplifted strata, and though not so highly inclined as similar rocks flanking the range elsewhere, they plainly bespeak the intrusive character of the mountain

masses. The granite has crystallized into huge irregular cubes, which weathering most at their bounding surfaces, produce the effect of cyclopean masonry, whose courses have been worn by time and disturbed by subsidence or convulsion. These seeming walls and towers are capped here and there by isolated blocks, poised as if by the hand of man, and threatening to fall with every gale. They, like the logan stones of Cornwall, are the result of weathering, and there are doubtless thousands of rocking stones to be found among these hills. The granite, being felspathic, decomposes easily, giving rise to great sand-slides or tali of fine *débris*, while the road, which is only a track worn by the wheels of the stage, is deeply covered with coarse granitic sand. The flanks of the hills are sparsely clothed with pines which huddle together in the sheltered ravines, and climb slopes almost too steep for the foot; while the wayside is carpeted with dwarf grasses and pear-shaped cactus.

After a drive of thirty-six miles, occupying seven hours, we looked down upon Estes Park, a flat, grassy depression, about four miles long and half as wide, dotted over with pines, bisected by a brawling stream, and entirely surrounded by mountains, some timbered to their summits, others rising above the timber line and streaked here and there with snow. The park evidently occupies the site of an ancient lake whose waters have escaped; but it now forms a natural amphi-

theatre where peak and plain, forest and stream, are combined, almost theatrically, to form a picture having the charm of a park with the sublime features of a mountain range.

The volatile member of our party, a man of pre-eminently social nature, had diluted the heat and industries of Chicago with hopes of being shortly "alone with nature among the everlasting hills;" and even the cynical balance of the expedition expected solitude as well as cool air in the Cordilleras. It is well known that Estes Park was purchased some years ago by Lord Dunraven, and we unconsciously presumed that his lordship became the proprietor of this remote estate in the character either of Timon or Nimrod. We were certainly told that besides the earl's cottage there was a good hotel in the park, but we thought this was probably a hospitable provision for his lordship's sporting friends and occasional English tourists. Commercial enterprise however grows rank on American soil, and even a child of primogeniture becomes a land speculator in the West. The hotel at Estes Park is a large establishment, and what the Americans call a "health resort," having a resident doctor and a regular *clientèle* of invalids, who not only derive great benefit from the air of this mountain sanatorium, but carry away, and therefore presumably spread, most favourable impressions of the location, thanks to the judicious management which makes every guest

acquainted not only with the beauty of the park but all its natural advantages whether for sport or agriculture. Hence, instead of being alone with nature, we found ourselves in a gay and crowded house, the company comprising several invalids, a few fishermen, a number of American tourists, and some foreign waifs and strays like ourselves. The host, to our intense surprise, greeted us with the cultivated voice and manner of a thorough English gentleman, and we found later that he was Lord Dunraven's partner in the purchase, who, with his pretty American wife, lives in a charming cottage near the hotel, and manages the affairs of the Estes Park Company, Limited, into whose hands the estate has now passed. For the first time since leaving New York we wondered whether we ought to dress for dinner; and this in the Rocky Mountains! But the war-paint of civilization had been forwarded with our heavy luggage to San Francisco, and both cynic and socialist searched their hand-bags in vain even for a linen collar.

Our host was indefatigable for the amusement of his guests. Yesterday he drove a party of us round the park in his four-in-hand, and the journey was interesting as much from the superb driving over roadless hillsides as from the wild beauty of the scenery. To-day he gave a picnic in Clear Creek, when the toilettes were as pretty and the lunch as good as if we had been under the trees of Cliefden Woods. To-morrow, a fishing party starts for the Big Thompson, where if any fishermen are

as lucky as ourselves, they may take, as we did, a hundred and twenty trout in a short afternoon. In the evenings the saloon was full and the piano never idle, while flirtation flourished on the verandah, as rapid and rank of growth as on the stairs of a London house in the season. Such was our introduction to life in the Rocky Mountains!

Estes Park is rather more than seven thousand feet above sea-level, and the hotel stands in the centre of a vast semicircle of hills some of which are among the highest in the Rocky Mountains. Long's Peak, only a little lower than Mont Blanc, lies on the left; Olympus and Ida—the latter named after our host's wife—face the hotel; and thence the range trends away northward, becoming lower as it goes. There is no definite snow-line, and what little snow remains lies in the gullies and among the higher timber. The timber-line however is clearly defined at an altitude of about twelve thousand feet, and above that the summits are bare rock. This absence of snow in summer from heights of nearly fifteen thousand feet, in latitude 41°, and during winter, from plains more than seven thousand feet above the sea, is very surprising. But the great dryness of the atmosphere which it bespeaks gives to the enclosed parks of Colorado one of the most beautiful and exhilarating climates in the world. The air is deliciously cool although the sun is hot; every day breaks with a cloudless sky, and the sunrises offer startling spectacles of pure colours; a

cool breeze rises every morning at ten o'clock, and blows fitfully till sunset. At night every star looks out of a deeply blue sky, and the Milky Way throws a broad and brilliant band across the heavens. It is never too hot for exertion during the day, nor too cold at night, and the atmosphere is so clear that we can distinguish all the details of Long's Peak from base to summit. In this dry air the nails become brittle and the hair harsh, food dries up, and bread becomes biscuit in a very short time. Lightning is always playing about the horizon, be the sky never so clear, and electric sparks are given off on approaching a knuckle to metal after shuffling across the floor in woollen socks. Our friend the doctor once produced an explosion like that of a rifle by pulling some woollen drawers quickly out of a pair of trousers, and the latter were covered with a sheet of flame.

Climbing is difficult at first on account of the dryness of the air, but after getting acclimatized fatigue is hardly felt. One of our party being out of condition, we gave up with regret the ascent of Long's Peak, with the intention of "doing" Pike's Peak, a slightly higher mountain, later on, and meanwhile we found some fine scrambles among the lower hills. One of our pleasantest excursions was to the Black Cañon, which brings a considerable stream of snow water to the Big Thompson river, and leads over a divide, somewhat higher than the timber-line, into Middle Park. This

gorge is densely clothed with pines, and an Indian trail, sometimes conspicuous, sometimes obscure, but always traceable, leads through the forest. The ascent is rough and toilsome, and we tyros were always a little anxious about missing the trail, which would not be easily found again when once lost. On the way we got splendid occasional views of Long's Peak and the range, and finally rose above the timber-line. Here full-grown pines give way very suddenly to bare rock, covered with large patches of granular snow. The air was piercingly cold at this elevation, and, wonder of wonders, we had a rainstorm, showers being common and heavy about the crests of the hills though rarely extending to their feet. We saw no large game on the way, the elk being among the timber at this time of year, and only descending into the park when driven from the higher feeding-grounds by the winter snows, but we started a few grouse—large birds like a pheasant, who let you walk up to them before they rise. Coming home by the Big Thompson river, in whose rapid stream the trout were rising fast, we found two beautiful kinds of wild flowers growing in the moist bottoms—a small tiger-lily of brilliant red colour, and a lovely wild cyclamen, the latter thickly clustering on the banks of the creek close to the water's edge.

It was pleasant, returning tired after our daily tramps, to find an excellent dinner of trout and mountain sheep, together with pleasant society, at the hotel;

and it was amusing to study Western manners in the billiard-room after dinner. Here a party of ladies and gentlemen, whose toilettes would have passed muster at a suburban garden-party, played pool at one table while a second was occupied by the ranchmen and servants of the estate; the room, which contained the bar, being usually filled with men dressed in canvas "pants" and wide hats, lounging, chewing, and drinking cocktails.

The American artisan assumes equality with the higher classes with perfect *naiveté* and good humour. No operative, especially in the West, doubts that the sale of labour stands on the same level with the sale of dry goods or "notions;" and if we were startled on the night of our arrival at Estes Park to find ourselves seated at the same table with the stage-driver at dinner, he at least proved an amusing and well-informed companion. The American working man is a very different being from his English *confrère*. He is usually the better educated of the two; but those who have mixed with the cream of the latter class know that they are better informed, and more interesting companions than the prejudiced or frivolous sections of our middle classes, in comparison with whom, if they have not easy manners, it is because they are made to feel like social inferiors. The American artizan on the other hand is not sharply separated from the class above him either by dress or by manners. It is only

in the workshop that he wears clothes suited to his employment; at home and in the streets his appearance is like that of his employer or any other citizen. This distinction may seem trivial to some people, but the case is one where trifles denote much, and the gap between the skilled artisans of the two countries is far wider than is indicated by differences in a coat. Fresh from England, I once offered a dollar to a New York mechanic who had given me a long and intelligent explanation of a certain process; but I was soon politely given to understand that I had made a mistake, and, while tendering an apology, I wished that such an incident could occur in England. Nothing but the British theory of caste prevents this. Our skilled artisans, would accept nothing, in such a case from an equal, while they are ready to pocket a shilling which, if it comes from a "gentleman," implies no insult, although it pays for no equivalent service. I once asked one of my own workmen, who had reappeared in the workshop when I thought he was in America, why he had come back. "Only to visit my friends," was the reply, "but I took a job to lessen expenses." "Do you earn better wages in the States than here?" "Well, I think about the same, for times are dull on the other side, but it costs me more to live in the States because I have a standing to keep up." "And is that why you are going back?" "Well sir, that is the only reason; I can do about as well in England, all things considered, as in America,

but I am a respectable member of society there, and here I am only a moulder." Necessity and custom have given manual labour—inadmissible among the higher classes of the Old World—a new character in America. Every one becomes a handicraftsman on occasion, willingly and without false shame. Hence the operative suffers scarcely any disabilities from labour, while he may avail himself of intellectual and material enjoyments which are reserved for the upper classes in Europe. For sensitive men bred in the refinements of the best European society, the less exclusive habits, less elegant life, and less polished manners of the States form a purgatory; but the country is the paradise of the artisan.

The "earl's cottage" is a pretty boarded house, which would however be more in keeping with its surroundings if built of logs like our host's house. The latter is charming both without and within; a home with the air of an English country house, but decorated with the spoils of nobler game than ours, and graced by the refined taste of an American lady; seated in whose exquisite little drawing-room it was difficult to believe that we were in the heart of the Rocky Mountains. It was easier to recognize the fact however while talking with Hank Farrar, the hunter, who was usually to be found on the piazza of the hotel in the evening. Hank is the guide, philosopher, and friend of every stranger who comes to Estes Park in search of sport; and it

was pleasant to listen to his slow good-humoured talk of elk and elk-hunting, and to admire his word-pictures of the chase and camp. Elk is much less abundant in the park than formerly, and a man must now work hard to find his game. In this regard Farrar makes no secret of the fact that he prefers hunting with Englishmen rather than with his own countrymen. The latter he accuses of being lazy; they will not do their fair share of work in camp, or slave all day for a shot. An Englishman on the other hand takes his full half of the labour in caring for and picketing the horses, camping, cooking, and breadmaking, while he is always earnest about his work, and will spare himself no fatigue to get his elk or mountain sheep. This was not said to please an English listener,—that is not an American fashion; and Farrar illustrated his views with so many stories that I fully believe his statement.

Good society, scenery, and trout-fishing had already detained us for a fortnight among the mountains, when we tore ourselves away from kind friends and excellent quarters and started for Longmont, *en route* for Denver, the capital of the west. The stage carried a much heavier load this time, needing a six-horse team; and the skill of the driver, which had not struck us so much on the lighter coach, became very conspicuous—disagreeably so at times—on the return journey. On three occasions we came as near capsizing as it was possible to do without failing; twice when the driver's attention had been

diverted from his horses for a moment to accept a chew of "Navy plug" from a friend; and once when the off middle leader hitched his hind leg up in the whippletree while descending a hill where pulling up was impossible. In the last case the horse was so stimulated by the thunderstorm of oaths which broke out upon the instant, that under its influence he continued to canter on three legs till we reached level ground, and thus averted an accident which was inevitable if he had fallen. It is difficult to make the reader understand the character of these mountain roads by any description without appearing to exaggerate their dangers; but I may say that the stage-driver's worst enemy is sideling land, traversing which the heavily loaded coach, with its high centre of gravity, often hangs over at dangerous angles. Labour again is so dear that mountain road-making cannot afford much assistance from art, and small gulches are consequently filled up with a minimum quantity of boulders or pine stumps. In these cases it is really necessary to drive to an inch, which, with six horses and a heavy rolling coach, requires great coolness and skill. The bridges over streams or wide gulches are made by throwing two stout pines across the gap and laying smaller pines across these again, forming a corduroy road, whose loose timbers rattle and shake under the passing stage, or it may be break, as happened to us at one such place, though fortunately the team was landed before the pines cracked, and the horses were

able to drag the stage up the gradually sinking incline.

We changed horses three times in the thirty-six miles. The stables are shanties of rough pine boards buried among the mountains. At one of these the young fellow in charge, handsome, active, but in very fine-drawn condition, was addressed by the driver as follows:—"What do you live on here Tom anyhow?" "Wal, I get a few flies mixed up sometimes, I guess." "Haow do they go with mountain scenery?" "Pretty wal I reckon, but I hev to live most of the time on the scenery." From this point we started before the stage on foot, and, the road rising, did seven miles before we were picked up again. Making a short cut in the course of this walk, we turned a point whence the plains became suddenly visible. At first sight we could hardly persuade ourselves they were not the sea, stretching away, flecked with the purple shadows of gliding clouds, to an horizon yellow and dim with dust haze. It was a beautiful scene. High granite towers hemmed in the way on either side and framed two glorious pictures. Looking southwards, we saw the blue-black gorges and sterile summit of Long's Peak, streaked here and there with snow, while to the north lay a mimic ocean, still, sunlit, and boundless. A fortnight in the mountains amidst cool air and clear skies had made us critical, and we grumbled a good deal as the stage emerged from the St. Vrain cañon into the heat and

dust-laden atmosphere of the plain. Our hearts turned to the pleasant party of sudden friends we were leaving, and our eyes to the beautiful hills, wrapped in diaphanous garments of azure and purple air, through which, as through a Coan robe, the range, half hiding, half displaying her beauties, showed herself to her lovers.

CHAPTER XVI.

DENVER.

July 14–16.

THE railroad from Longmont to Denver runs almost due south over the plains, skirting the range at an average distance of fifteen miles, but approaching it more nearly now and then. On the right are the blue hills, capped as we pass with pink sunset clouds, while to the left stretches an apparently boundless desert of yellowish drift, arid, treeless, and, except for patches of cactus, entirely bare; the home of chipmunks—small striped squirrels—and prairie dogs. The mountain outlines are extremely sharp and jagged, showing no signs of glaciation, and they probably were never covered to their summits by the continental glacier, of whose extent and action so much has been said; but vast terraces of drift run out from the flanks of the hills into the plain, looking like unfinished railway embankments. Massive as the range is, it does not impress the traveller as much as the mountains of Switzerland. There is hardly any snow, and the clearness of the air leaves nothing to the imagination, which, always taking the

unknown for the magnificent, creates for itself the sense of size out of clouded peaks and gloomy gorges. The air of Colorado is so transparent that it is impossible to estimate distances ; instead of fifteen miles away the hills look close at hand. A couple of Englishmen once started, so they say, from Denver for the foot hills, judging them to be four miles off. After walking eight miles and finding themselves apparently no nearer to the range, they came to the Denver irrigation ditch, about four feet wide. One of them stopped on the bank and began to strip, his companion exclaiming, "Why, what are you going to do?" "I'm going to swim this river." "Why man, it's a ditch and only a yard or so across." "How the deuce do I know it isn't a quarter of a mile? We've been fooled enough already, and I'm not going to risk a wetting ; you can jump if you like." This atmospheric transparency not only impairs the power of judging distances, but seems to dwarf the size of objects as well. A line of hills nearly two hundred miles long is in view from the cars ; they are high, massive, and occasionally snow-capped, yet we are obliged to tell ourselves that they are part of one of the great mountain ranges of the world. The plains on the other hand are almost painfully impressive, so wide and desolate are they. There are no mountain streams between Longmont and Denver ; and no strips of cultivation therefore break the monotony of the desert landscape ; but here and there the derrick and engine-house of a coal-mine rise like a black

island out of the plain. The glacial drift is thinner here than it is further north, and the cretaceous strata below it contain beds of lignite which are worked wherever the overlying mass of sand and pebbles is not too thick.

The cars of the Colorado Central Railroad are filled for the most part with miners or men connected with mining interests, and we observed that most of them carry arms. Opposite me a young giant in a blue flannel shirt and canvas trowsers stretched himself, now this way, now that, in search of a comfortable position for a nap, and as he rolled sleepily about a pretty little revolver dropped from his pocket. I picked it up, and gently waking the young Hercules, suggested that if the pistol was loaded it would be better not lying around loose. With a mixture of thanks and oaths he re-pocketed the weapon and took another awful reach after comfort; but the thing was on the floor again within a few minutes and I thought it best to secure it until my friend should awake. As we neared Denver, the giant, refreshed with slumber, took the revolver once more from my hands and, wishing I suppose to repay my attention, said in a hoarse voice finely flavoured with whisky, that he would show me the "All-firedest hotel in Denver," if I would put myself in his charge. We declined the offer with many thanks and left him playing with his pretty toy, and looking very sorry not to be of service.

The Platte river on which Denver is built, was rolling

at headlong speed on our arrival, a mad, muddy torrent, through the bridge just outside the town. Men and lights were moving about the abutments, which were evidently considered in danger of being washed away, and the train crawled over to the other side at a snail's pace. My neighbour in the car was returning from a short journey and had left Denver only four hours before, at which time there was hardly a drop of water in the bed of the Platte. Floods like these arise from heavy rains on the range, where the clouds sometimes discharge their burden like the breaking of a water-spout, and every cañon then carries a boiling stream to the plains. At such times, as upon this occasion, the water rushes in a solid mass five or six feet high down the almost flat and usually narrow bed of the river, spreading right and left to a great distance and wrecking bridges and dwellings in its course. Men on horse-back race the flood from higher to lower levels and give what warnings are possible in advance; but little can be done on these occasions beyond watching the railway bridges, and within a few hours the Platte is again empty. At the moment of our arrival, rain was the question of questions in Denver. There had been none for more than a year; the Platte was pumped dry, and the mayor had issued a proclamation enjoining the most rigorous economy in the use of water. Now, every one is cheerful. The wrecks are forgotten, and if the flood had carried away a quarter of the town it would have been

welcomed in Denver. The thunder was roaring loudly, and the sky over the range was intensely black as we walked from the depôt to our hotel, but though a drenching rain looked imminent, not a drop fell, and so it is throughout the rainy months. The hill-tops are swathed in clouds, lightning flashes, thunder rolls, and torrents fall on the range, but only an occasional shower wanders out into the plain.

Denver, the capital of Colorado, is one of the peculiar creations of the swift tumultuous advance of American civilization, originating in and sustained by the thirst for gold. Lying out in the plain at some miles' distance from the range, it possesses no mineral wealth itself, but its position makes it the natural metropolis of the Rocky Mountains, and every new mining discovery is a fresh stimulus to its growth. The first settlement of white men within the limits of Denver was made by a party of prospectors who, attracted to Colorado by the reports of gold, camped here in 1857–58. The camp soon grew into a city, and in 1859, not only had a child been born within its walls, but municipal government had been established, a mayor elected, a newspaper published, public worship performed, and a theatre opened. Four years later Denver was almost destroyed by fire, and within another twelvemonth the new wooden houses rising from the ashes were swept away by a great flood. Such events are but episodes in the history of these strange mining towns, and the city now con-

tains twenty thousand inhabitants, thirty hotels, many great commercial houses, a branch of the United States Mint, fine churches, schools, a splendid opera-house, and streets of elegant private residences. All this in the heart of a desert.

The town is rectangular in arrangement, as usual; the streets are wide, and the roads—wonder of wonders!—excellent. The citizens are proud of these roads, but without reason, for they have had nothing to do with their being so good; the plain hereabouts consisting of a mixture of loam and gravel which forms hard and durable tracks without artificial aid. But the Western man is apt to take credit to himself whether fairly or unfairly, and in his higher flights would persuade you, if not himself, that the blue mountains themselves and all their mineral wealth are creations of the great republic. Every street is planted with cotton-wood "shade trees," which are watered from ditches lining the side-walks. The shops are excellent and beautifully kept. About half the houses are of brick, the other half being of wood, and the pavements are of planks badly nailed down as usual. The drinking saloons are numerous, tastefully fitted up with walnut-wood and graceful draperies, whose Parisian elegance contrasts strangely with the company frequenting the bars. Handsome horses and equipages are common in the streets, especially in the late afternoon when all the world goes "buggy-riding." This is the time for seeing the ladies of Denver,

who are not less fond of dress and jewellery than their New York sisters, and like to display both in their daily drive. The absence of women is a most striking feature of Denver. The streets are full of men, but one rarely sees a woman, and the men themselves appear to form a very fugitive population. A *queue* forms daily at the post-office, waiting for letters addressed "till called for," and seldom numbers less than a hundred people, among whom fresh faces are seen every day. Almost all these men wear the blue shirt denoting a miner's occupation, and this crowd of "transients" forms a strange feature of Western life to our unaccustomed eyes.

The Chinese form an important element in the population of Denver. Hitherto we have seen but few Chinamen, although they are present in all the American cities. In New York they have superseded washer-women, while there are factories in Massachusetts—notably a large boot and shoe works at North Adams—"run' by Chinese labour. At Estes Park several Chinamen were employed about the hotel, and they are always to be seen in the cars of the transcontinental railroad; but it is only in Western America that the yellow race assumes any numerical importance. So far as we can judge, the Chinaman seems to fill his humble place in an exemplary manner, and our sympathies are already enlisted on behalf of this well-behaved and industrious worker. But the public clamour against him is loud, and we have as yet had so few opportunities of observa-

tion, that we shall reserve our judgment in regard to the Chinese question until we reach California, where the Mongols are most numerous and most unpopular.

Public order has been established in Denver for some years past, but only, as in so many other western cities, by violent means. At the present moment the "rowdies," though strongly represented, are afraid of the respectable element of society, knowing that if a steady citizen were to shoot a rough in the course of a "difficulty," a jury would not convict; whereas if a rowdy is taken red-handed, or only suspected of foul intentions, no mercy is shown. But though the town is generally speaking orderly, outrages sometimes occur. A tram car was attacked in Larimer Street, one of the chief thoroughfares, during our short stay, by two fellows, who tried to make away with the cash-box. We were in the street at the time and heard the shots which the conductor discharged from his revolver at the thieves, but being near a small shooting gallery at the moment, we had no notion that highway robbery was being attempted within a few hundred yards of us. The newspapers mentioned the incident next morning but without any comment! On the other hand I have patrolled Denver late at night, and though I saw many picturesque figures, who might be either miners or brigands, lounging at the corners of streets, I was never molested, and the town seemed as quiet as an English village.

One evening we attended a "social hop," to which, in common with all the world, we were invited by public placard. Not knowing whether a social hop might or might not be given by the social evil, but presuming that the city hall would only be lent to respectable people, we paid our fifty cents entrance money and found ourselves among about a hundred persons of both sexes who were waltzing, polking, and quadrilling to the music of a good band. The ladies looked like "helps," and the men like mechanics, but both the dancing and behaviour were excellent. The girls were simply but tastefully dressed and the young men inclined to dandyism. Dance programmes hung from every man's button-hole, and introductions were as ceremonious, and etiquette as strict, as in a London drawing-room. Seeing we were strangers, a polite steward found us partners, and whether for good waltzing, animated conversation, or thoroughgoing enjoyment, we would back the social hoppers of Denver against even a London "small and early."

"There are more flies in Denver than anywhere else in the world and they stick more." Such is the dictum of the natives and it is true so far as our present experience goes. I have never seen flies thicker or more affectionate. If the waiters did not fan one during meals, only a few fragments of any dish would remain many seconds after the cover is removed; and if the creatures did not sleep at night, life would be a burden.

Colorado is English almost as much as it is American. We knew more about this state ten years ago than the Americans themselves, who regarded it as little better than an arid wilderness. Englishmen early settled here in some numbers, taking up land for cattle ranches, digging irrigation ditches, investing money in real estate, building hotels in Denver, and mining in the range, until they are now quite a commercial power in the state. Among American enterprises in Colorado, Senator Hill's smelting works are the most important. They are situated at Argo, just outside Denver, and reduce the chief part of the ores mined in the state, turning out about one ton of silver and fifty pounds of gold weekly. The process of silver extraction consists in first crushing and roasting the ores to expel the sulphur; the residue is melted to get rid of the silex and earthy matters, and a metallic "mat" results, which is reduced to a fine powder and gently heated, when the remaining sulphur combines with oxygen from the ore, producing sulphuric acid. This attacks the silver, forming a soluble sulphate, while any gold that may be present remains in the "mat." The silver sulphate then flows over copper plates, which take metallic silver from, and give up copper to the fluid by interchange. The sulphate of copper is sold as such, while the silver, which appears in a white and spongy condition, is dried and finally run into ingots. The gold in the mat is reduced by a secret process known only to Mr. Hill and his manager, and

upon this secret the prosperity of the Argo Works is built. Ores differ enormously in value—a lean one, located where transport is easy, being often better worth mining than much richer lodes less accessibly situated; but the average yield of the precious metals at Argo may be taken as sixty ounces of silver and one ounce of gold to the ton of ore. The dry air of Colorado has a curious effect on the sulphurous vapours that issue from the roasting furnaces of the Argo Works. In Swansea, as is well known, vegetation is killed by similar fumes evolved in the reduction of copper, and chimneys are sometimes carried to the tops of hills in order to discharge the copper smoke high up in the air. Here however the sulphurous acid diffuses into the atmosphere and no condensation takes place in consequence of the absence of aqueous vapour.

The range, always in view from Denver, dressed in hourly changing garments of pink and purple, gold and azure, tempted us to return to its cool glens every time our glances sought the west. The attraction was too powerful to be long resisted, and at length our hand-bags were gleefully stuffed a day before the time appointed for our next move up to the mountain towns, or "mining camps" of the Rockies.

CHAPTER XVII.

THE MINING CAMPS OF THE ROCKY MOUNTAINS.

July 17–20.

We left Denver for Central City, one of the most important mining camps of Colorado, by the Colorado Central Railway, retracing our steps across the plains for fifteen miles to Golden, a small smelting town close to the foot of the range. Here a mountain stream called Clear Creek debouches from a cañon and enters the plain, seeking the Platte river. Golden, though standing on drift, is nearly six thousand feet above the sea, while Central is eight thousand three hundred feet in elevation; and the railway which connects the two places rises therefore two thousand five hundred feet in its course of forty miles. A narrow gauge of three feet six inches has been chosen for the mountain railroads of Colorado, both on account of its lower first cost and because it is better suited for steep inclines than a wider gauge with heavier rolling stock. Our train consisted of six passenger cars, a freight car, and an "observation" car—the latter an open truck from which we got capital views of the scenery, though we were terribly bom-

barded on the upward journey by ashes from the labouring engine.

The cañon is narrow, and for the most part filled with a thick level deposit of detritus, through which the stream, evidently much smaller now than at some former period, flows or leaps in a channel always steep and sometimes precipitous. The rails occupy the left bank of the "crick," and rest for the most part on the floor of detritus; but here and there the gorge narrows, the *débris* disappears, and the river foams between strait rocky walls which rise precipitously on either hand to heights varying from a thousand to two thousand feet. Nevertheless the stream winds like a river flowing through flat meadows, and the train rolls around curve after curve at a uniform speed of eighteen miles an hour, until after passing many stations once busy with "gulch mining" it reaches Black Hawk, thirty-seven miles from Golden and seven thousand three hundred feet above sea-level. Here the valley is wide enough to hold a considerable town full of foundries, stamping-mills, and smelting works. The distance between Black Hawk and Central is only a mile and a half as the crow flies, but there is a thousand feet difference in their levels, so the railroad zigzags up the hill-side, the train travelling now forward, now backward, over a series of dizzy inclines, having a total length of about four miles. The position is a remarkable one for a railway traveller. Around him are the peaks of the range whose sterile summits

gleam with occasional snows. Right beneath his feet is the busy little town of Black Hawk, whose chimneys shoot their pointed flames from among rolling clouds of smoke. Lower still the white thread of foaming Clear Creek slips in seeming silence through hidden eyes in pointed needles of rock. And at this great height he steps from the cars into Central City, a flourishing mining camp of three thousand souls, perched at an elevation of more than three hundred feet above the Alpine line of perpetual snow.

The little town consists of a straggling collection of wooden shanties dotted all over the steep hill-sides, but clustering more closely at one spot where a short street contains a number of excellent shops, three banks, three hotels, and several churches. The bare brown hills are burrowed everywhere with seeming rabbit-holes, from whose mouths run out little embankments of bright-coloured mining rubbish, while here and there horses are seen treading the mill round of windlasses or whimseys. The streets are deserted during the day, but all the world is astir in the evening, presenting faces of a type which is very familiar to us. Two-thirds of the miners in Central are Cornishmen and the balance either Norwegians or Germans. Native Americans are seldom found underground; they "prospect," and sell their "claims," generally preferring the manufacture of balloons to the founding of solid industries, and having little stomach for the hard work of a miner's life.

Nothing was known of the existence of the precious metals in the mountains of Colorado before 1852, but in the summer of that year a Cherokee cattle-dealer found gold in an affluent of Clear Creek, and members of the tribe continuing to prospect, they finally obtained a moderate quantity of the precious metal. The first party of American prospectors entered Colorado in the early part of 1858, but their success was only partial, and it was not until 1859 that the first gold-bearing lode found in the state was discovered by a man named Gregory. This was a true "fissure vein," as it is called in America, of auriferous quartz very rich in gold. It crosses the valley now called "Gregory's Gulch," between Central and Black Hawk, and, although the first, has proved the richest find in this neighbourhood. Many similar discoveries followed that of Gregory, and two years afterwards it was estimated that the new mining camps of Colorado contained together a population of twenty thousand souls. The pioneer prospectors, seeking gold only, never thought of silver, and finding it without recognizing it, threw it on one side as worthless; but in 1864 a Central assayer, named Dibbin, detected silver in some ores sent him for analysis, and since that date the mining history of Colorado is chiefly a record of silver discoveries on the one hand, and the introduction of scientific processes of reduction on the other. Gold, which is found exclusively in quartz rock, and in a "native" or pure metallic state, is often

accompanied by silver, usually in the form of a sulphuret. The inexperienced eyes of the early miners failed to recognize these silver ores, and in some cases lodes which have been abandoned on account of their poverty in gold are now being worked as silver mines. Gold as well as silver is still sought in Colorado, but the prosperity of the mining camps rests chiefly on silver.

"Gulch mining," the earliest form of gold-digging, consists in washing the sandy detritus of river valleys, and collecting the free gold which subsides by virtue of its specific gravity. The erosion of a mountain glen in rocks containing mineral veins, constitutes a gigantic natural process of quartz-crushing and gold-washing, whose operations have been continued over enormous periods of time. As frost and rain slowly carve out the valley, the fragments of rock falling from time to time into the stream, are converted by its action into sand and pebbles. In the course of this operation, the quartz parts with its gold, whose flakes and scales are however too heavy to be carried away like sand, so that they remain scattered among the detritus left in the gulch and accumulated chiefly in the upper valleys and at the lowest levels. Gold in fact can neither be destroyed nor removed far from its original position by natural means. It has come into the quartz we know not how, but it is inoxidizable, so that the atmosphere cannot consume it as it would any other metal under

similar circumstances, while its high specific gravity prevents its distribution by water.

In some valley then whose gravels have been proved by preliminary washing to be auriferous, the gulch miner sinks a shaft down through the detritus to the bed rock, and upon this floor runs a tunnel or gallery up stream. Water percolates freely through the loose roof and sides of the burrow, but is kept under by pumping. A portion of the stream, diverted from its bed higher up the valley, turns a rude water-wheel, which operates the pump and raising windlass. The mine is worked by two "pardners" who dig and wash by turns, the former employment being wet and heavy work. The contents of the bucket are emptied on a platform and shovelled thence into the "sluice box." This is a long wooden shoot, supplied at its upper end with a constant stream of water and discharging into the creek. The shoot is provided with "riffles," or strips of wood nailed at short intervals across the bottom, which serve to retain a charge of mercury placed there for the purpose of amalgamating the finer particles of gold which might otherwise escape. The riffles are "cleaned up" at regular intervals, the amalgam being squeezed in a linen bag for the recovery of free mercury, while the heavy sand which they contain is transferred to the "pan," a saucer-shaped tin vessel, where the larger pieces of gold are separated out by hand-washing. Gulch mining has almost ceased to exist now that all the

auriferous gravels of Western America have been washed. Only the patient Chinese practise it, at the present moment, working over again gravels which the white man considers exhausted.

In "fissure vein" mining, quartz outcrops are sought among the mountains by prospectors, who, when they find a promising "lead," drive in eight stakes, enclosing a space of fifteen hundred feet by one hundred and fifty feet, and this is called a "miner's claim." To convert such a claim into freehold property it is needful to put five hundred dollars' worth of labour into the mine within one year, and this being done the United States Government issues a title. The professional prospector rarely carries his operations beyond this point, but tries to sell his claims, and it is probable that as much money has been fooled away over bubbles blown very big by "smart men," and glowing with iridescent lies, as has been made by honest mining.

Fissure vein mining is carried on in the same way as copper and tin lodes are worked in Cornwall. A shaft is sunk, and galleries constructed, striking the vein at different levels; and the ores on reaching the surface are sorted and crushed, after which they are for the most part sent away to Argo, to be reduced as already described. No great lodes have yet been found in Colorado, the quartz veins varying from a few inches to a few feet in thickness, whereas in Nevada, lodes occur which are two or three hundred

feet thick. The mines are small, carried on without adequate capital, and in the rudest way. There are fewer people engaged in mining in Colorado than we were led to expect from the exaggerated statements made to us in Denver, and the mining camps of the Rocky Mountains cannot for a moment be compared with the great and organized operations which we have yet to see in the Sierra Nevada.

These, however, are by no means the opinions of the Coloradans. They believe, or would have you believe, that their claims are all El-Dorados, and their shares priceless. We were fortunate enough to make the acquaintance of a Mr. Fillmore, "attorney and mining agent," whose office, a small wooden shanty, was fitted with shelves filled with specimen ores from every mine in the neighbourhood. One wall was covered with photographs of bare hill-sides, pierced here and there with tiny burrows and dotted with shanties, the pictures representing the "richest mines in the state." Mr. Fillmore himself was a glib man with an enthusiastic manner, roving eyes, and long grey hair, who sold town lots and mining shares in earnest, and called himself an attorney apparently in jest. Thinking probably that an Englishman in Central City could only be explained as a possible investor, he took us into his "prettiest little parlour" of an office, and sidling from shelf to shelf, showed us the world and all the riches thereof. His eyes glowed and his white hair floated as if electrified by excitement

while he delivered an eloquent address on the potential wealth around us, describing mines which were all Golcondas, and "town lots" which were paradises. His ardour was infectious, and made us feel so rich that we determined to take some stock in the "richest mine in the state" as soon as Fillmore could make up his mind which that was. But the last lode was always the best, and finally the "attorney and mining agent" piled it up so high that the entrance of a fourth party was a relief from an excitement which was getting too much to be borne—seriously. The new-comer was a Mr. Bozey, to whom we were ceremoniously introduced as "one of our earliest prospectors, a gentleman who has found and sold more good mines than any man in this state, and who is now resting on his oars."

Mr. Bozey was a fat millionaire, dressed in shirt sleeves, and evidently resting even from the labour of washing his hands; but he enjoyed Mr. Fillmore's dish of melted butter exceedingly, swallowing it in silence, and remaining a perfectly dumb oracle to the end of the interview. When the great man was gone, the mining attorney looked at us with benevolence beaming from his glowing features and flying hair. His face said plainly, "Gentlemen, I can make Bozeys of you both;" but we felt in want of a little fresh air after the millionaire, whose well-timed entrance and exit had thrilled us like a melodramatic situation, so we said *au revoir* to our apostle and left him preaching the gospel of gold

in the doorway, and half hoping that the seed had fallen on good ground, half fearing, from an untimely smile on the socialist's face, that we had received the word with the wrong sort of gladness.

Idaho Springs is another mining town distant six miles from Central, lying on a branch of Clear Creek, the divide which separates the two valleys being seven-teen hundred feet above Central City or ten thousand feet from sea-level. Driving over this ridge we ex-perienced a curious electrical phenomenon. Daily at this season of the year clouds cover the summits of the range about two o'clock and heavy showers fall; these are accompanied by thunder and lightning and usually last about half an hour, when the sky clears again as suddenly as it clouded, but the rain extends only a very little way from the hill-tops. It was raining but without lightning as we neared the divide, when I felt a tickling sensation on the back of my hands like what one ex-periences when standing on a glass stool and in con-nection with the conductor of an electrical machine. Judging that a discharge was taking place from our persons I tried to increase its intensity by holding one of the wet umbrellas point upwards above the waggon. This at once produced a distinct sensation in the hand and arm, and on mentioning the matter to the driver he exclaimed, "I guessed you felt it when I saw you looking at your hands. It's common enough here, though many don't know what it is and others don't

notice it." This man was very nervous about crossing the divide while it was thundering, and plainly said that if there was lightning he must wait for fair weather. He declared that the ridge is constantly struck and very unsafe during thunderstorms, a moving horse or buggy being very liable to accident, while once in the gulch, no matter how little below the summit, there is no danger.

The approach to Central City by the Colorado Central Railway is, as we have already seen, a succession of frowning precipices and bare mountain slopes; but the valley of South Clear Creek is hemmed in by less rugged hills, the barren crags are replaced by pine-decked slopes, and the stream is no longer a torrent but a gliding brook, while the gulch is almost too open to be called a cañon. Idaho was first settled in 1859 by a party of gold-diggers, who commenced gulching where the town now stands. In the same year a small log cabin was built by a man named Beebee, who catered for the miners' physical wants, but this has now grown into a great hotel—the "Beebee House," for Idaho possesses soda springs and has become a health resort as well as a mining town. Two years after the camp was first pitched, Clear Creek Cañon was alive with gold-diggers, and gold dust was the universal medium of exchange in this then remote spot. In 1864 came the discovery of silver, followed first by a new excitement for fissure vein mining, and then by the gradual decadence of

gulching. Several mineral springs were discovered in sinking the earliest shafts at Idaho; and these having been exploited by an enterprising medical man, the place now attracts a number of Americans, always great valetudinarians. The Beebee House is yearly crowded with these real or fancied invalids, who drink the waters or lounge in the sun on the piazza, weighing themselves daily to see whether they are improving.

The deserted bed of a creek which has once been the site of active gulch mining is a curious sight. The stream flows between banks composed entirely of great heaps of washed pebbles, clean and bare of any vegetation. Wrecks of water-wheels, flumes, and sluice boxes lie here and there, accenting the desolation of the scene; and if a group of Chinamen should be seen, their blue frocks, conical hats, and pig-tails give the last touch of outlandishness to the picture.

A mass of detritus with a surface flat as a floor, through which the creek meanders, fills the bottom of Clear Creek Cañon to a depth of about seventy feet. It consists of sandy soil, thickly stuffed with boulders varying in size from stones as big as a piano to pebbles. All of them are water-worn and free from glacial scratches, but there are trains of boulders lying on the shoulders of the hills at heights of two and three hundred feet, where they could only have been left by ice, and many of the blocks in the river-bed are so large as to preclude the idea of their being water-borne. The

stones differ from the local rock, having travelled, as we afterwards found, from a point twenty miles further up the stream, and the whole must have been deposited during a state of things totally different to that which now prevails. The erratics which line the hill-sides up to heights of more than three hundred feet, and the tumultuous assemblage of sand, stones and boulders in the bed of the stream, point to a time when Idaho Valley was nearly abrim with ice, as well as to a later period when the melting glacier poured a roaring torrent of water down the gulch which now carries only a comparatively tiny stream.

A branch of the Colorado Central Railway follows South Clear Creek from its point of junction with Clear Creek to Georgetown, fourteen miles above Idaho, and the highest mining camp in the Rocky Mountains. Georgetown lies in a perfect amphitheatre of hills, at an elevation of eight thousand four hundred feet, or five thousand feet higher than Chamounix. It is considerably larger than Central, and notwithstanding its elevated situation has all the appearance of an old settled place. Its streets are numerous, wide, and busy; it has capital shops, and many hotels. The snow does not often lie for more than twenty-four hours in winter, and the sun is warm and pleasant in January;—this at the height of the perpetual snow-line in Switzerland. Mining towns, like Western cities, are soon seen, and we were now pretty familiar both with the wooden

homes and burrows of the miners; so giving Georgetown a passing glance, we started up another branch of Clear Creek in search of the granites whence the Idaho pebbles were derived, and to visit Green Lake—a small sheet of water dammed by moraine, at a height of sixteen hundred feet above Georgetown, or ten thousand feet from sea-level.

The narrow gorge is very fine. The stream falls so rapidly that for the first mile its course is an unbroken sheet of foam. Its bed is cut through enormous lateral moraines lying on the flanks of the mountains, and containing boulders of stupendous dimensions. Some of these are as big as a moderate-sized house, and where they have fallen the stream is put to shift after shift to outflank the tremendous obstacles in its path, while the valley is cumbered with such a confused mass of blocks as defies description. We were fairly staggered by the dimensions of the boulders, and scarcely less surprised by the elevation and mass of the lateral moraines, whose presence showed that the continental ice-sheet had once stood here at least ten thousand feet above the sea. The hills around us were pierced to their very summits with little burrows and seamed with white, yellow, or grey mining tips, while delicate, zigzag lines, betokening trodden paths, branched downwards to the valley, and stretched from mine to mine. Green Lake is a small basin hidden among tall pines, holding

this moraine-dammed pond was tame indeed compared with the superb views of the range which now presented themselves in every direction. The hills bend round Georgetown in three-fourths of an almost perfectly symmetrical circle—Mount Evans, Gray's Peak, and James's Peak, some of the highest summits, being included in the view; while they are seen without reference to the plain, which elsewhere seems to partially bury and consequently dwarf their masses. The afternoon storm had lingered longer than usual, lightning flashing and thunder growling during the whole of our walk; but just as we turned to descend, great indigo wreaths gathered themselves together in the south, capping Mount Evans with almost terrifying gloom, while the sun shone brightly over the pines and crags of the most inspiring view we had yet seen in the Cordilleras.

The train swept us rapidly down the grades and past the precipices of Clear Creek Cañon to Golden, and thence across the hot and dusty plain to Denver, where we dined before starting for South Colorado by the Denver and Rio Grande Railway. I mention this dinner because it was made remarkable by the fact that we accidentally sat down, six Englishmen, at one table in the Windsor Hotel. Three of the six were settled in the state, and whatever may have been their temptation to belong to the Yankee nation, they certainly all remain enthusiastic Englishmen. This fortuitous concurrence of atoms fraternized and made itself merry, and whether

by good-fellowship or champagne I do not know, but we got the national balloon which burst at Washington repaired, and took in a fresh charge of patriotic gas, sufficient we hope to float us to the misty portals of the Golden Gate.

CHAPTER XVIII.

MANITOU—PIKE'S PEAK.

July 21–29.

EIGHTY miles south of Denver lies Manitou, a mountain "health resort," famous for its mineral springs, and the point whence the ascent of Pike's Peak is usually made. It is six thousand three hundred feet above sea-level and stands among the tilted strata which everywhere rest against the eastern flanks of the Rocky Mountains, whose granite core has intruded through the once level beds of mesozoic and tertiary age which lie beneath the drift of the plains. Manitou is quite a fashionable little place, always crowded during the summer with American tourists and invalids; it has several large hotels, and the native exquisite of both sexes is seen here in full bloom at this time of the year.

Certainly American ladies dress in a very *prononcé* way. Their breakfast toilettes are good enough for the dinner-table, while for dinner they dress as we do for the opera. They are great on ornamental hose and tiny French shoes, and having pretty feet are quite disposed to let the world know it. Their jewellery, if

too abundant, is costly and beautiful in its design, which stands between the lightness of French and the solidity of English work. American ladies never walk, but they go out "buggy-riding" in dancing shoes and ball dresses, or amble about on ponies in highly ornamental riding habits. All this seems very odd among the mountains, where the surroundings, as at the Riffel or upon Dartmoor, would suggest serge walking dresses and stout Balmoral boots to English-women. The men too are curiously lazy about walking; both tourists and invalids sit about the piazza, talking dollars, smoking, and spitting almost all day; but no one treats his holiday as an occasion for taking exercise. If athletics were a cult in America, as with us, there would probably be fewer men here who, though in the prime of life and having no specific ailment, suffer from some "trouble," usually of digestion, often of nerves, and spend their time drinking mineral waters, weighing themselves, and discussing their daily progress.

Men and women are never seen to advantage in a fashionable watering-place, and neither at Scarborough nor Trouville is society at its best. But fashionable life in Manitou seems more frivolous, not to say faster, than at similar places in the Old World. It may be that what appears to us licence is only the natural result of woman's greater freedom, and certainly social propriety is as rigidly observed in the States as in Europe, but while the men are more solemn and shoppy, the women

are decidedly gayer and more openly anxious for attentions than with us. The billiard-room and the bowling alley are brilliant with beautiful toilettes every evening, and there are as many ladies as gentlemen with cues in their hands. Representing domestic duties by business cares, men and women seem to have changed places; the woman is the pleasure-seeker, while the man gravely revolves his home affairs.

Although parties of Americans make the ascent of Pike's Peak almost daily in the summer they characteristically prefer riding to walking, and we astonished our guide by declaring our intention of going up on foot. He on the other hand said he "wouldn't take twenty dollars to walk it," and rode. This mountain is fourteen thousand two hundred feet above sea-level, and its summit is occupied by a United States meteorological station, where two observers are constantly stationed. Such an arrangement would of course be impossible at a similar elevation in Europe; but here there is seldom snow enough to block the trail which leads to the signal station, and men can live there very comfortably in the winter. Besides the Government trail as it is called, a second route leads to "Seven Lakes," where, at an elevation of eleven thousand feet, there is a small mountain ranch, and here we determined to sleep for a night, so as to be ready to attack the peak in time to see the sun rise, returning to Manitou on the evening of the second day.

The trail is very steep for the first three miles, rising thirteen hundred feet in the mile, and following Ruxton Cañon, the bed of whose roaring stream presents a scene of the wildest confusion. The gorge is very narrow, having precipitous flanks covered with patches of pine, but cumbered at the bottom with masses of fallen rock, many of which are as big as a large house. The rock is granite, which has all the appearance of being bedded in lines crossing the valley at a moderate angle. These "beds" are very variously affected by the weather, some crumbling readily, while others waste but little. On the side of the valley where the beds hang towards the stream, the wear of the softer strata leaves vast overhanging masses of rock, which, when undermined beyond a certain point, break off and fall into the cañon. Where the rocks are most friable the flanks of the valley and the hills themselves are covered with great "sand-slides," or tali of granitic *débris*, and the juxtaposition of softer with harder granites gives rise to most fantastic weathered forms, which line the sides and crown the precipices of the cañon with spires and pyramids, quaint profiles, and the images of strange beasts. The daily storm burst upon us about two o'clock, and instead of clearing as usual, stuck by us for the rest of the day. The lightning playing among the pines around us was very fine, and the thunder reverberated, as it seemed, for minutes. The ascent became much less steep after the

first four miles, and thence to Seven Lakes the trail, though difficult to find in places, was little more than a long and toilsome walk in the wet.

These mountain cañons are all alike in one respect; their beds are steepest and their sides most precipitous near the plain, but at elevations of about nine thousand feet their flanks widen, becoming like those of an ordinary river valley, and the ascent sinks to an easy grade; often indeed the cañon leads up into smooth and level basins many miles in extent. The narrow and precipitous gateways of the cañon however are clearly no accidental cracks convenient for the escape of water flowing from above, for, when viewed from such a distance that general characters prevail over particulars, they have each the appearance of having been cut by the stream itself. When this first began to flow over the hill side it must have been dammed in many places by irregularities of surface giving rise to lakes of greater or smaller area, the overflow from each of which never ceased cutting its way backwards, through the retaining bank until the lake was drained. The beds of such old lake-like expansions of the stream are found in the upper reaches of every cañon, and sometimes afford space enough, as in the case of Idaho Springs, for the building of a town.

The pine is very characteristic of American mountain scenery, and gives it a peculiar tone which is not agreeable at first. Seen from a distance the hill-sides appear

to be clothed with scaffold poles, while a cold grey, rather than a green tint distinguishes the forest, unless the trees are thickly massed in ravines, when they look almost black. Within the forest itself the pines are still more like scaffold poles; all of them are bare of branches up to a great height; many are dead, and fallen trees are so numerous as seriously to impede the way whether of horseman or pedestrian. Burnt patches frequently occur, and the charred trunks and blackened underwood give a repulsive character to the scene.

The Seven Lakes are a series of large ponds, dammed by glacial moraine, and occupying a depression which is almost entirely surrounded by bald peaks, rising from five hundred to a thousand feet above a well-defined timber-line. Here we found comfortable quarters in a log house built by a man named Welsh, who, with a strange taste for isolation, has taken up land in this remote spot and is stocking the lakes with mountain trout, in order to supply the Manitou hotels with fish. Meanwhile he entertains such tourists as prefer to make the Pike's Peak trip in two days rather than in one, and we had to thank him and his wife for much kindness during our stay, which was unexpectedly prolonged by the indisposition of one of our party. Three days indeed were thus thrown on the hands of half the expedition, who whiled them away by tramps to Bald Mountain in search of topaz; in fruitless pursuit of deer-trails across the sand-slides; in rowing a crazy

boat over the lake, which was crowded with great external-gilled newts; in playing quoits with old horse-shoes; watching the tricks of the half-tame chipmunks, or painted squirrels; playing euchre; or listening to Indian stories told by the guide.

At length—the invalid riding—we were able to start for the summit, which was reached after a few hours' stiff walking, and here we were welcomed by the signal service observers. These men are soldiers, well-educated and intelligent fellows like the privates of our Royal Engineers. They live in a stone hut where, if luxuries are absent, there is no want of substantial comfort. The station is connected with Washington, and therefore with all the world, by a telegraphic wire which serves to despatch observations as soon as they are made. There is a capital library, and if the position is lonely in winter, there are daily visitors from Manitou all through the summer. The men are frequently relieved and seem to like the service. As might be expected from the great elevation, there is little electrical equilibrium between the summit and the lower levels, and the telegraphic instruments were constantly snapping like the excited conductor of an electrifying machine.

Many of the highest peaks in the Rocky Mountains occur quite independently of the watershed, and Pike's Peak is several miles eastward of it, rising indeed only just without the upturned strata which flank the range and lie in great "hogbacks," as they

are called, against the granite uplift of which the peak is a part. A heavy snowstorm accompanied with thunder and lightning signalized our arrival at the hut and threatened for a long time to deprive us of any view; but after a couple of hours the cloud was withdrawn, displaying the beauties of the scene in quite a theatrical manner. The whole of the northern and western horizon was filled with the serrated profiles of hills, many of them still nameless, belonging to the Continental Divide. These merged in the south-west into the Sangre de Cristo range—a spur of sufficient importance to have been separately named. In the south rose the "Spanish Peaks," conical hills almost as high as Pike's Peak itself; while eastward the eye ranged over the sea-like plains, flecked with the purple shadows of a thousand clouds. Immediately at our feet lay a wide expanse of tumbled mountains, bare for nearly two thousand feet below, and clothed with dark forests thence to the plain. It was a beautiful picture; but in spite of their immense mass, the mountains have not the sublimity as they have none of the grace of the Swiss Alps.

The country between Denver and Manitou forms a low divide, separating the streams flowing towards the Platte and Arkansas rivers respectively, and the "Fontaine qui bouille," which runs through Manitou, finds its way by the latter route to the Father of Waters. This "boiling spring," so called from its turbulence, rises on

the flank of the granite upheaval only a few miles west of Manitou and in its course towards the plain crosses at one place the edge of a hogback lying against the hill-sides. The latter consists of a thin bed of extremely hard sandstone, which, stoutly resisting weathering, gives a peculiar and interesting character to the cañon. Throughout that portion of its course which lies among the granite, the stream flows in an open valley flanked by low and gently sloping hills; but it traverses the hogback in a deep, precipitous gorge and in a series of cascades. It is clear that the hard capping has determined the section of the cañon by preserving the friable rock beneath it from degradation. If the protecting bed were absent, these rocks would have weathered, as they have done higher up the stream, into an open V-shaped valley; but the tough sandstone has prevented their wasting, and hence the deep U-shaped gorge, whose precipitous sides contrast so strangely with the undulating country immediately above. Here then we have a cañon still in course of excavation by means of an overflow which is cutting its way backwards in the manner already suggested; together with an example of the influence which the juxtaposition of hard and soft rocks may exercise in producing widely different profiles of river valleys.

The hogbacks of mesozoic and tertiary rocks lying against the granite core of the range are turned up at all angles. Those which lie immediately on the core

itself partake of its slope, but a little further off others are seen which are quite perpendicular. The effects produced by erosion among these vertical beds are very remarkable. The "Garden of the Gods" is a fanciful but inappropriate name given to a little valley where rock pillars and needles, some of which rise to a height of three hundred and fifty feet, abound. One of these is a hundred and twenty feet high, while its base is not more than ten feet in any direction; but this obelisk-like form is exceptional, the beds usually rising from the ground in wall-like masses which must be viewed edgewise to look like aiguilles. Thus seen, especially at sunset, these columns of red sandstone have a singularly artificial and weird appearance as they flame out like copper in the red evening light.

But bizarre as they are, these examples of erosion are surpassed in strangeness by the columns of "Monument Park," situated among undisturbed tertiary strata some ten miles from the foot of the hills. Here the plain, consisting of a loosely compacted white sandstone, is dotted with tapering pillars, from six to fifty feet high, each capped with a flat overhanging stone of dark colour. They stand sometimes in closely associated groups, sometimes alone, and look like sugar-loaves wearing college caps. They are of the same material as the soil, from which they have evidently been shaped; and the flat stone at top is a fragment of a thin bed of similar sandstone, indurated by the percolation of

water containing iron. Here and there the ferruginous layer is continuous, though for the most part it is broken up into plates more or less separated from each other; but however it occurs, it locally stops that degradation of the surface which is constantly going on under the influence of wind. Whenever this blows it scatters the slightly coherent sands of the soil to great distances, and thus gradually degrades the plain; but as the surface beneath a protecting plate cannot be carried away, a pillar necessarily results from the lowering of the surrounding soil. The pillar again assumes a tapering form because the erosive forces have been at work longer upon its neck than its base, and the former indeed becomes in the course of time a mere stem upon which the widely overhanging flat stone appears to totter. Finally the latter falls, and the pillar, no longer protected above, moulders down and disappears, while beneath the fallen cap, now protecting another spot, a new and similar column begins to grow. When the hard bed is continuous it gives rise to cliffs, and the groups of columns are usually found on their flanks; the question of column or cliff being determined by the continuous or broken condition of the hard vein. Examples of every stage of growth and decay abound, and the simple process can be traced from its first to its last stage, while its apparently artificial results excite the liveliest interest.

When Monument Park and the Garden of the Gods have been seen and Pike's Peak ascended, there is

nothing to be done at Manitou beyond sitting on the hotel piazza, admiring the brilliant and ever-changing toilettes of the gay American girls, and wondering at the portentous gravity of the men. But for two pedestrians in good condition this was tedious work, and our worn tweeds and heavy walking boots seemed out of place in the well-dressed crowd. Already this charming state had held us much longer than we had anticipated, and the Grand Cañon of the Arkansas, together with Leadville, the last mining miracle and a really "rough" camp, had to be seen before Southern Colorado was exhausted. Within an hour after coming to this conclusion we had said good-bye to more than one pleasant table friend, and were *en route* for the stupendous gateway by which the Arkansas river breaks through the range and enters on the plain.

CHAPTER XIX.

THE GRAND CAÑON OF THE ARKANSAS—LEADVILLE.

July 30—*August* 2.

THE Arkansas river rises on the flanks of the continental watershed, and after a course of more than a thousand miles pours its water into the Missouri. For the first hundred miles of its existence this stream is a mountain torrent, fed by the snows of the range, from whose foot hills it issues to the plain through a narrow gorge, having precipitous sides nearly three thousand feet in height. This is the "Grand Cañon" of the Arkansas, to reach which from Manitou the traveller skirts the mountains, following the southward course of the "Fontaine qui bouille" to its junction with the Arkansas at Pueblo, and then turns due west along the valley of the latter river to Cañon City. Before Pueblo is reached the drift which covers the plain everywhere to the northward begins to thin out and finally disappears, revealing the underlying cretaceous rocks, which are here composed of a white, friable limestone. At a distance of a few miles from the range these

beds lie horizontally, but on the flanks of the hills they have been tilted upwards by the granite upheaval like the rocks of mesozoic age at Manitou. Streams traversing the level beds of the plain give rise to peculiar valleys, whose flanks are formed by flat-topped cliffs called "mesas," to which the horizontal lines of stratification lend the appearance of masonry. The mesas are deeply buried in the rubbish which falls from their sides, and look exactly like railway cuttings capped with dwarf walls. The valley of the Arkansas is bounded on both sides by these natural walls whose remoteness from the present river-banks shows how widely the stream has wandered since it first began to flow. But stranger appearances are presented by the vertical beds of the tilted series as the train approaches the range. The edges of the soft strata have been worn down to the level of the plain, while the hard beds stand up exactly like artificial walls. These walls again are not continuous, but have been breached here and there by streams, and the approach to Cañon City has consequently all the appearance of having been once defended by military works which are now in partial ruin.

Cañon City lies on the plain but is very near the hills, and viewed from one of the neighbouring hog-backs has a strangely Oriental aspect. A group of white, flat-roofed houses occupies a small space in the midst of a yellow desert, sparsely covered with tall branching cacti. A green streak, representing the cotton-

wood trees which line the river Arkansas, winds across the plain and through the town, being finally lost in the distance. Bare, serrated peaks, rising from the shoulders of mountains, themselves deeply sunk in the sea-like plain, carry the eye to a far-distant horizon. The air is full of a yellow dust haze which seems to add to the glare of what might well be a Syrian sun. It is the East itself reproduced in the deserts of the West. In the early days of gulch mining Cañon City flourished wonderfully. Standing in the gateway of the hills, it formed a base of operations for the diggers who were working in every mountain valley of the Arkansas river, and was the point where the rush from the plains concentrated. It became quite suddenly a town of six thousand inhabitants; but the gravels were soon washed out, the Ute Indians "made trouble," and Cañon City, like so many other western mining centres, burst like a bubble. Coal and oil however have brought back men whom the failing gulches could not keep; the river has been tapped, land irrigated, farm produce and fruit raised; a brisk trade with Leadville, the new mining camp on the headwaters of the Arkansas, established, and a fair amount of prosperity still attends the little town which now numbers about two thousand souls.

Five miles west of Cañon City the Arkansas issues from the hills, and the last six miles of its course among them is justly called the "Grand Cañon." Throughout the whole of this distance the river flows between

precipitous rocky walls which tower in some places as much as three thousand feet above its bed. One part of this extraordinary channel, called the "Royal Gorge," has absolutely vertical sides two thousand feet high and not much more than fifty feet apart. From above the traveller can look directly down upon the river foaming through the narrow chink; while below he could jump, if he dared, across the deep but narrow stream. Although so trench-like at first, the cañon widens after a few miles into a comparatively open valley, but even its straitest and deepest portions give evidence of having been excavated by the action of water.

Originally the work of streams, all the cañons of the Rocky Mountains have been partially shaped by the ice which filled them during the glacial period. That they were so filled is amply proved, as at Idaho, by the lateral moraines still lying on the flanks of their upper valleys, and by the huge travelled blocks which cumber their beds; and, this being so, it is not a little surprising at first to find so few of the ordinary marks of glaciation in these rocky gorges. But the friable granites, universally present in the Coloradan hills, weather so rapidly that grooves and striæ must soon have disappeared, and only a hard bed here and there now retains the scratched and polished surfaces which undoubtedly characterised every valley in the Rocky Mountains at the close of the great ice age. Glaciated rocks occur at intervals throughout the Grand

Cañon, sometimes so smoothly polished that they reflect the sun's rays like a mirror; and everywhere the hog-backed outlines of ice-worn surfaces appear, bespeaking the passage of a glacier as plainly as if grooves and striæ were present.

Walking leisurely through six miles of this astounding scenery, astonishment grows with every step at the stupendous character of the work which has been accomplished by means apparently so feeble. The tool and the finished job stand side by side, only the chips have been swept away; but looking from one to the other of these, it seems impossible to believe that a thin thread of running water has ploughed out this tremendous trench. The mountainous portion of the Arkansas Valley is however very remarkable. Its western flank is formed by the continental watershed, and its eastern flank by a parallel range or spur, equalling the great ridge itself in elevation and distant from it about twenty miles. At the junction of these two great chains of hills stands Mount Lincoln, fourteen thousand three hundred feet high, upon whose sides the Arkansas river rises, and the vast depression in question, forming the mountain bed of the stream, is more than a hundred miles from source to mouth. That mouth was once dammed by a cross range of hills which retained, as with an embankment three thousand feet higher than the plain, all the water above it, and, where that water found an overflow, the work was begun which did not end until the cross

range was cut through from flank to flank, and the Grand Cañon completed.

Near the head-waters of the Arkansas and standing almost upon the Continental Divide, at an elevation of more than ten thousand feet above the sea, is the city of Leadville, the greatest mining marvel in America. Four years ago its site was a bare mountain side, but to-day its population is variously estimated at from fifteen to thirty thousand souls. At the time of which I write the Arkansas Valley Railroad had reached within a few miles of the town, and so rapidly was the line advancing that though I staged three miles from its terminus to Leadville on a Saturday night I left the city in the cars on the following Monday. Of the railway journey from Cañon City to Leadville it is difficult to speak without appearing to exaggerate its beauties. Leaving the wall-like scenery of the cañon, we entered upon an open valley, whence, rosy and golden long after we were in shadow, the peaks of the range came successively into view as we swept rapidly past their feet, while later, when the moon had risen, their cold white cones glittered in the silver light. It was a journey never to be forgotten. Contrary to what would be supposed until the character of cañons and their higher valleys is understood, mountain rail-roading is much easier at its highest than at its lowest levels. In the cañon proper the track must be blasted out of wall-

gentle grades make the work almost as easy as on the prairies, and certainly easier than over ordinary hilly country.

California, Stray Horse, Evans, and Iowa Gulches —all famous in the early mining history of Colorado— are situated near the head-waters of the Arkansas. The first was prospected in 1860, and, the gravels proving very rich in gold, a rush followed, which, in the course of a short time, crowded all the gulches in question with gold-diggers. The tiny affluents of the river, feeble because so near their sources, hardly furnished water enough for the sluices, and, extensive methodic workings being thus prevented, the surface washings were soon exhausted, so that six years after the rush these gulches were almost deserted. In 1874 however water was brought from the Arkansas itself, a distance of twelve miles, by two miners, for the purpose of systematically working their claims in California Gulch. Operators in this valley had always been troubled by the presence of very heavy sand in the sluices, which filled the riffles without yielding gold; but it never occurred to anybody to have this unwelcome deposit assayed until 1876, when one of the men in question, named Ward, proved it to be carbonate of lead carrying a great deal of silver. Thus for sixteen years had the gold-diggers of California Gulch, like the miners of Georgetown and Central, failed to recognize silver in the rubbish which they abused for the trouble

it gave them in the sluices. Finally, in the ridges which separate the gulches in question, and at no great depth from the surface, the lead carbonates themselves were found *in situ*, not occurring in fissures as mineral veins generally do, but disposed in thick horizontal, or rather undulating, layers of considerable extent.

The value of this find was not at once apparent, and by January, 1878, there were not more than three hundred men working in the "Sand-Mines," as their claims were contemptuously nicknamed by the fissure-vein miners. In that month however a meeting was called to organize a town, and was attended by eighteen men who, after considerable discussion, selected the name of Leadville, and a fortnight afterwards, a mayor and recorder having been elected, the infant city came to the birth on January 26, 1878. Six months later two prospectors, named Rische and Hook, being at the moment completely hard up, asked the new mayor, who sold groceries in the camp, to supply them with the necessaries of life while opening a new claim, upon condition of his sharing with them anything they might find. The mayor's name was Tabor, and a short time after breaking ground Rische and Hook struck the mine now known throughout the world as the "Little Pittsburg." Within two months they had sold out their joint interests for half a million dollars, while Mr. Tabor

the Governor of Colorado State. All the fat was in the fire; other lodes were found, and, though the new town was a hundred and twenty miles from any railroad and without a stage line, the latter was at once established, the former was commenced, and the daily arrivals were soon counted by hundreds. In the twinkling of an eye Leadville has become a city. Two railways have reached it, spite of its remote and elevated position; substantial houses have arisen; banks, hotels, even a great opera-house, built by Mr. Tabor, have been opened; churches have been erected, waterworks and fire stations organized, and newspapers started;—and this at an elevation of two thousand feet above the Alpine snow-line, and where all supplies must be drawn from the plains, a hundred and twenty miles away.

The Leadville carbonates occur in so abnormal a manner that it is doubtful whether they will prove permanently valuable. It is thought that they merely occupy pockets, and the recent failure of one mine after another seems to favour this view. In the mean time the Leadville find is the most astounding incident which has yet occurred in the history of mining for the precious metals, as the rush which followed it surpassed all that had previously taken place.

The social aspects of Leadville are as extraordinary as its situation and history. It is a "hard" mining camp, but it is not lawless. All the restless elements of western life are present, curiously blended with eastern

method and perseverance. The crowd which throngs the streets is like no other crowd in the world, it is so rough yet so very much in earnest. Only a few women are visible, and the men might be taken for ruffians but for their conspicuous look of self-reliance and self-control. The first of these qualities, the child of self-help, is almost universal among the pioneer population of the west; while the last comes perhaps of every man knowing that the revolver in his pocket shoots no straighter and is reached no quicker than that of his neighbour. Take a ruffian then with a character modified by respect for the weapon of another, and dignified by self-confidence; dress him in a wide-brimmed felt hat, a blue flannel shirt, brown canvas "pants" tucked into high-heeled Wellington boots which have seen neither blacking nor brushes since their birth; put a broad leather belt round his waist; give him long and dusty hair; fill his mouth with tobacco juice and extravagant profanity;—and you have a picture of the men who crowd the streets and saloons of Leadville from morning till night, or rather from morning till morning, for night, as a season of rest, is almost unknown in this wicked town, where there are perhaps six or seven thousand men actually engaged in mining and prospecting, and an equal, if not larger, number of gamblers, rowdies, gaming-house and saloon keepers, thieves, and prostitutes assembled to prey upon them.

The American miner is a gamester *pur sang*. Keno, faro, and roulette are his favourite games and these are openly played in public gambling-houses on the main street. All three are games of pure chance, and seemingly very poor amusement; yet the rooms are nightly crowded with the characters already described, who play in perfect silence (barring a "difficulty") well into the morning hours. In the side streets are "dance-houses," where girls in ballet costume perform within a ring, outside of which a mob of miners looks on. Sometimes the women "rope in" a few male dancers from among the spectators and then the fun grows fast and furious. Elsewhere, standing at the open doorways of a whole street, women, sometimes in stage costumes and painted up to the eyes, solicit passers-by; while the gaping front doors and brilliant lighting of other houses bespeak the homes of a higher grade of the prostitute's profession. Music halls, where fast songs are sung, abound, and there are several theatres giving variety entertainments, chiefly of an indecent character. At the Tabor Opera-House highly coloured melodrama sometimes finds a home for a few weeks, but this sort of thing must be mixed with a good deal of firearms in order to attract. At all these places the audience is alike—a crowd of slouch-hatted, independent men, full of strange oaths, and having a freedom of manner which is very striking to a stranger. Every man drinks whisky, smokes a cigar (never a pipe) and spits as

freely as he swears. Drunkenness, though by no means absent, is not conspicuous, and I saw no quarrelling. The various amusements go on till three o'clock in the morning, and the traveller arriving, as I did, at two o'clock a.m., finds the town brightly lighted and as much alive as at noonday. The stores are open and newspapers are published on Sundays, when, however, a number of well-dressed people, sprung one knows not whence, attend the various places of worship. I went alone into many of the saloons, gaming and dance houses, and found them orderly; but lest I should take away too good an impression, there was a "man for breakfast" on the morning after my arrival, making two such repasts served up within a week.

The city itself lies in an open, park-like valley, once heavily timbered but now entirely bare of trees, which have been felled for house-building and smelting purposes. It is circled with snowy peaks, and the air is keen, although the sun is hot, while it freezes at night even in midsummer. There is but one street of substantial houses, all the rest consist of rough log huts, and the stumps of the primeval forest still stand in the roadways. To drive a buggy through such a *chevaux de frise* seemed impossible, nevertheless I found myself in the trap of a new friend, threading Leadville streets at a brisk trot, within a few hours of my arrival. The mines lie to the north-east of the town, among the ridges of which I have already spoken. The

"Little Pittsburg" and the "Chrysolite" are the most famous lodes, but there is so much talk about exhaustion that strangers are rigidly excluded from the workings, possibly lest they might be spies sent out to ascertain whether the land be naked or no. A characteristic sight occurs near the town, where a wide space of ground, several acres in extent, is entirely covered by empty meat-tins. The mining camps of the west depend on canned provisions, but, in spite of a now intimate personal acquaintance with this useful form of food, the stretch of tin-drift, glittering like a great mirror in the sun, and diversified with blackened tree-stumps, was a surprising spectacle.

Georgetown, Central, and Idaho, are quiet, humdrum old places in comparison with Leadville, which reproduces the old Californian days of '49, though shorn of their wickedest features; and it is the only place in the world at the present moment where that most strange and characteristic sight, a rough American mining camp, can be seen. Leadville is blooming at the time this is written, but already the geologist thinks he sees the handwriting on the wall; and it may be that, after the pockets of the mountains are once emptied of their carbonates, the city will wither as it rose, in a night; and the tourist of a few years hence, following the Arkansas to its mountain sources, may find the "roaring camp" of to-day absolutely deserted, and slowly strewing the lonely shoulders of Mount Lincoln with its ruins.

The railway was completed to Leadville during my stay, and I steamed out on the first train that ever left the mountain city, returning direct to Denver by the Denver and South Park Railroad—a line which, leaving the Arkansas Valley at Buena Vista, climbs a low pass in its left flank and, crossing South Park, falls into and follows the narrow and tortuous cañon of the South Platte river, running thence across the plain to the Coloradan capital. Like all mountain railroad trips, this journey had its own peculiar attractions. South Park is another Estes Park in its structure, being evidently the bed of an old lake once imprisoned among the spurs of the range but now drained by the Platte river. Its wide levels are, however, tame and uninteresting, and I was glad when we left them to clamber over Kenosha Summit, and drop into the cañon of the South Platte. Kenosha Summit is ten thousand one hundred feet above sea-level, and the highest ridge yet scaled by the railway in North America. The descent winds down by a series of zig-zags, and from the car one sees below the road to be travelled, while above is the one already traversed; and far, far down, the river valley, into which it seems as if the train might fall at any moment. It is a magnificent ride, but exciting, on account of the many mishaps that have occurred on the road; the curves are very sharp, and it is no uncommon occurrence for the engine to leave the rails. But we reached the bottom safely and then twisted for many miles through the narrow cañon,

shut in by high walls of granite and gneiss, and accompanied by the brawling Platte; till, reaching the plain at sunset, and unwillingly breathing once more its hot and yellow air, we sped over the desert flats to Denver.

CHAPTER XX.

SALT LAKE CITY.

August 3–9.

THIRTY-SIX hours spent in a Pullman car carry the traveller from Denver to Salt Lake City. The Union Pacific line is rejoined at Cheyenne, soon after leaving which town the train crosses the watershed of the continent, eight thousand feet above sea-level and about two thousand feet higher than Cheyenne. This is no ridge, but a wide plateau, reached by gentle grades, and, but for a painted board on which the railway company have thoughtfully inscribed the words "Summit of the Rocky Mountains," there is nothing to indicate that the Continental Divide has been reached. The rocks are composed of the same friable granite as in Colorado, and fantastic weathered shapes abound. Snow-sheds are built in the depressions to protect the line from drifts, but the snow-fall is so small that the winds clear the hills, and cattle range in search of open ground, or drift before the severer storms, during the whole winter. After crossing the summit the railroad descends gently into the "Laramie Plains," which are covered with

short nutritive grasses and tenanted by innumerable herds of cattle. If Wyoming is, as our friend the ranchman declared, "God's own footstool for cattle" then the Laramie Plains are its cushion. The eastern and western flanks of the Rocky Mountains are strongly contrasted in regard to vegetation, the former being brown and bare while the latter are green and fruitful. Game, of which we saw nothing in Colorado, was plentiful on these plains, where, from the train itself, we saw many antelopes and "grouse." By-and-by the granite gives way to mesozoic rocks, sometimes jurassic, sometimes cretaceous, and these are succeeded by level beds of eocene age which, being soft and horizontally bedded, weather into the strangest castellated shapes. To these, as to the mesas, the stratification gives the appearance of masonry, while the erosion, as in the case of Monument Park near Manitou, is almost entirely due to the action of the wind, which scours the country in tremendous gusts, sweeping away the loose soil, or flinging it, like a sand blast, against the crumbling cliffs.

Echo Cañon is a valley cut through these soft beds, and its sides are carved from end to end with fantastic forms, sometimes monumental, sometimes architectural, the whole having a singularly artificial appearance, in consequence of the level bedding. Echo Cañon leads to Weber Cañon, where a series of beds, ranging from the top of the jurassic to the bottom of the coal measures, is exposed, rising more or less

vertically from beneath the flat tertiaries, and reposing on the flanks of the Wahsatch range. The train runs for many miles through the picturesque and varied scenery to which this uplift gives rise, and presently issues from the cañon into an open country of level meadows, once evidently an old lake-bed, across which, in company with the Weber river, it approaches a magnificent mountain wall standing square across the path and seeming to bar the way of both road and stream. This is the Wahsatch range, whose snow-capped and serrated profile stretches away north and south until its outline is lost in the hazy distance on either hand. On its farther side is Salt Lake, into which we know the Weber falls, but we look in vain for indications of the spot where the stream breaks through the apparently continuous rampart before us. Finally we are close upon the "Devil's Gate" before we see it, and acknowledge that the name has been appropriately given to the narrow portals of shattered gneiss, through which the river has forced a passage. This mountain gateway opens on a plain which is at once recognized as the bed of a vanished inland sea, of which indeed Salt Lake is but the bitter and dwindling dregs. The western flanks of the Wahsatch range are terraced to a height of nine hundred feet above the plain, each terrace marking a pause in the gradual subsidence of the water. The lake-bed itself looks as if it had been drained yesterday, no vegetation in this arid climate having

yet covered its deposits of loess. The line runs across its levels for fourteen miles, to Ogden, where the Union Pacific Railroad ends and the Central Pacific begins, and where also is the junction for Salt Lake City, which lies about forty miles south of the transcontinental route.

The City of the Saints is like no other in America. Seen from a distant standpoint in the hills, it wears the same quasi-Oriental aspect as Cañon City, but in all other respects it is *sui generis*. It stands at the feet of the mountains, on the edge of an apparently boundless plain, with Salt Lake shining in the sun twelve miles away. The plain is cultivated near the hills; but only a few miles beyond the city, it becomes a desert, where nothing grows except wild sage and great sunflowers. Detached white houses, each standing in a garden of its own, gleam from among thick foliage which is furrowed here and there by rectangular lines of yellow dust, marking the courses of travelled streets. The oval dome of the great tabernacle, and the rising mass of the new temple, dominate the town, which is overarched by a sky of the tenderest blue and enveloped in an atmosphere of indescribable purity. On a near approach the Saints' houses are found to be surrounded with orchards and trees, which almost entirely hide them from view. They are built for the most part of "adobe," or unburned bricks; and architectural taste is conspicuously absent even in the most ambitious residences. The same may

be said of the tabernacle, which is a hideous oval building, crowned with a kind of shingle dish-cover; while the new temple, built of a beautiful local granite, is hardly worthy of a carpenter in design. In fact it may be taken for granted that cultured taste, whether in architecture or decoration, does not exist among the Mormons. The wide streets are bordered with "shade trees" of cotton-wood, and in every gutter a swift little stream of mountain water bustles gaily along. Only the shops thrust themselves on the notice of passers-by, and these are numerous, well-stocked, clean, and, wonder of wonders in America, cheap. No American towns, except Philadelphia and Washington, can compare with Salt Lake City for cleanliness; its roads are excellent, and there is evidently no slackness in the performance of their municipal duties by the saints. Perched on the hillside, high above the town, is Fort Douglas, a small stronghold built by the United States Government after the Indians had been driven out from Bear Creek in 1873, ostensibly to guard against their further incursions, but really to overawe the Mormon capital. When the fort was first located, Young sent word to the lieutenant that he forbade him the flanks of the Wahsatch, and got a curt reply from that officer, whereupon the prophet followed his message with a threat. The lieutenant's second answer consisted of three shells, which, entering the roof of the tabernacle, finally closed an argument that has not since been reopened.

Joe Smith, the founder of Mormonism, was born in Vermont in 1805, and received his first "revelation" at the age of eighteen. Four years later he became, according to his own account, miraculously possessed of the Book of Mormon, a collection of metal plates, engraved in "Egyptian" character, which the seer translated by the supernatural aid of the "Urim and Thummim." It need hardly be said that this book is a farrago of nonsense, but it formed a basis for the organization of a Church of the "Latter-Day Saints" which was first established in 1830 at the town of Fayette in the state of New York. Affiliated Churches soon arose in other states, and a considerable Mormon settlement was formed in Missouri, which was however attacked by a mob and destroyed in the same year. The fugitives made a second home at Clay, in the same state, whence they were again violently driven in 1836 by a mob, and the same thing was repeated in another county two years later. At length, in 1839, the exiles fled to the then remote state of Illinois, where they found a friendly home, took up land, built their city of Nauvoo, and enjoyed religious freedom for a time. In 1844 however they were again threatened by a mob and the prophet Smith was imprisoned, but before he was brought to trial, a band of men, with blackened faces, surrounded the gaol, and, overcoming the State authority, shot Smith and his brother Hyram dead, and wounded Taylor, the present Mormon president, who

was confined with them. Previously to this, Smith had been brought before judicial tribunals nearly fifty times, but had always been acquitted, and, from first to last, he and his community suffered nothing at the hands of the law, but everything from violence. The assassins were brought to trial but were acquitted, and the Mormon persecution went on until, in the fall of 1845, a mob, which the Sheriff of Hancock County vainly tried to control, commenced house-burning at Nauvoo. Shortly after this the Mormons agreed to quit the state, and asked to be left unmolested while they made their preparations for departure. The exodus began in February 1846, when more than a thousand families crossed the Mississippi Valley on the ice, hoping by their timely flight to allay the excitement against those who were not able to leave in the winter. Brigham Young, who became president on the death of Joe Smith, directed the operations of the emigrants, and having established a temporary town in Nebraska and a great waggon encampment on the Missouri, he, with a hundred and forty pioneers, started west in the spring of 1847, seeking a permanent settlement. By midsummer, the pioneer party, "led by the inspiration of the Almighty," camped in the great Salt Lake Valley, but the main body of Mormons did not arrive until the fall of 1848, and winter overtook them still at the foot of the Wahsatch range. Young's original intention undoubtedly was to reach California and establish the saints in Mexi-

can territory, but during the halt at Salt Lake the Mexican war had ended in favour of the Union; California, as well as Utah, had been ceded to the Americans, and further advance became useless. In the spring of 1849 therefore a provisional government was organized under the name of the "State of Deseret," and the foundations of Mormon power in the west established. In the following year Utah became a "territory" by Act of Congress, and such it still remains, although the population has long been large enough to justify its conversion into a state. This step the United States Government, in spite of Mormon pressure, have hitherto refused to take, wisely preferring to retain the power of appointing the governor, land agent, and judges, instead of surrendering all control into the hands of a purely Mormon state legislation. There is no question that the same policy will continue to keep the saints in check, and safeguard the growing Gentile interests of Utah until either Mormonism itself dies of inanition, or is dealt with by American law. Such is an outline of the history of the Latter-Day Saints from their establishment by Smith to the foundation of Salt Lake City, which, commenced in the year following the arrival in Salt Lake Valley, has grown to a town of twenty thousand inhabitants, nine-tenths of whom are Mormons, and become the capital of a territory having a population of a hundred and forty-three thousand, of whom no

Before regarding either the theocratic government or religious character of the Mormon community, it will be useful to examine what it has accomplished from the point of view of material progress, and learn something of what these men are from what they have done. It is the boast of Mormon leaders that they have made the "wilderness blossom as the rose," replacing sterility with fertility in a quite exceptional manner, and that the Church swells in numbers as no other religious body has ever done. But, touching cultivation in the first instance, the new-comer from Colorado cannot fail to be struck with the difference between the irrigation works of this state and those of Utah. The Mormons have watered the fringe of land lying at the very feet of the hills, using the simplest means for this purpose, but they have undertaken no important works such as should long ago have spread cultivation over the still desert area stretching between the city and Salt Lake. In Colorado, on the other hand, organized ten years later than Utah, immense sums of money have been spent on scientific irrigation, with the result that while less than a million acres of land have been taken up in Utah during the last ten years, nearly two millions have come under the plough in Colorado in the same period. Still more striking results appear on comparing the Mormon territory with Kansas and Nebraska, where, though both these states were settled four years later than Utah, thirteen million and nine million acres

were taken up respectively between 1870 and 1880. Mormon theocracy boasts of its desert roses, as if the saints alone could raise flowers in the wilderness, but for every bloom which Utah has put forth, Colorado shows two, Nebraska eight, and Kansas ten.

And if we push economic inquiries in various directions a similar answer attends them all. Thus, while the total population of Utah, settled in 1850, is a hundred and forty-three thousand; that of Colorado. settled in 1861, is a hundred and ninety-five thousand; of Nebraska, settled in 1854, four hundred and fifty thousand; and of Kansas, settled in the same year as Nebraska, nine hundred and ninety-five thousand. Or, reducing these figures in each case to show the annual increase of population, while Utah grows at the rate of four thousand eight hundred souls yearly, Colorado gains ten thousand; Nebraska twenty-eight thousand; and Kansas thirty-nine thousand per annum, and this in spite of polygamous competition. Similarly, while Utah has made six hundred miles of railway, Colorado has built twelve hundred, Nebraska sixteen hundred, and Kansas three thousand miles. Or, turning from material to intellectual progress, it appears that Utah spends nine-tenths of a dollar per annum per head on the education of her school population, Colorado and Kansas spend each one dollar and a tenth, and Nebraska two dollars and a tenth for the same purposes. The traffic returns of the Utah Central

Railway, by which all exports and imports leave or reach the New Jerusalem, are equally significant. In the year 1873, a total of one hundred and nine thousand tons of goods were received and twenty-seven thousand tons despatched by the line in question; while the imports fell to a hundred and one thousand tons and the exports to twenty-three thousand tons in 1879, in spite of the yearly increasing consignments of metals which are now being made by Gentile miners.

The day after our arrival, being Sunday, we visited the tabernacle, a huge and hideous building, large enough to hold several thousands of worshippers, but containing no more than fifteen hundred on the day of our visit. We placed ourselves where a good general view of the congregation could be obtained, and found the Mormon faces even more commonplace in character than we had anticipated. The American type was not to be seen anywhere, but the people looked like, what they indeed are, the dregs of Britain and Scandinavia. In form, the service was similar to that of an English Nonconformist chapel, both prayers and sermon however being extremely commonplace, though free from any special Mormonite doctrine. A curious feature of the ritual consisted in handing the Eucharistic elements round to the whole congregation, exactly as if they were refreshments, during the progress of the sermon.

Enough has perhaps already been written about the theocratic government and religious aspect of the New

Jerusalem, which, together with its has been treated too much as a prodigy. It is no doubt an extraordinary fact that Brigham Young should have succeeded in creating and upholding in the very centre of the American continent, a state of things which is entirely opposed to the ideas of our race and our time, but this result has really been reached by very simple means. It must be admitted that Young was a man of vast ambition, a great organizer, fertile in resource, selfish, unscrupulous, and a born tyrant. But he possessed the magic of cordiality, and a magnetic presence which controlled while it seemed to persuade, and inspired devotion among people who were really his slaves. It must also be remembered that, after the last exodus from Illinois, the Mormon community was not again disturbed in its remote mountain home, and had already consolidated into an *imperium in imperio* before America had any ground for thinking that her deserts were destined to be brought within the fold of civilization. This immunity from external interference, while giving scope to Young's powers and leading him to developments little dreamed of at first, has ended in presenting the Mormon difficulty to America in an aggravated shape; a disagreeable, if not, as some think, a dangerous legacy from the unwise violence of 1844–45.

Contrary to what is usually supposed, polygamy formed no part of the Mormon faith as preached by Joe

Smith. Smith himself had but one wife, and the same thing was true of Young for some years after the settlement in Salt Lake. Brigham was "no saint," as the phrase goes, but it was not until he was firmly established as the inspired prophet, absolute sovereign, and military chief of the Mormon community that he ventured on promulgating the "Revelation on Celestial Marriage." It was in 1852 that Young first produced a document, bearing the above title, whose contents he declared had been revealed to Joe Smith a year before his death. Smith's widow and son denounced the story as apocryphal, but such was the influence of the prophet at this time, that the "revelation" was accepted at a meeting of Mormon delegates, and its doctrines became the leading feature of the Mormon faith from that time. Polygamy however was not the bait by which proselytes were in the first instance attracted to the New Jerusalem, nor indeed did it become so even after the promulgation of the "Revelation on Celestial Marriage." Young's want, like that of America at the present time, was labour, and in order to procure this he established missions in almost every European country, in Australia, and even in India and China. The last were soon abandoned, but religious labour agencies were prosecuted with the utmost energy in Britain and Scandinavia, whence, especially from Wales and Denmark, a constant stream of emigration flowed to the head-quarters of the saints. Only the lowest classes were sought by the

Mormon missionaries, and to these poor toilers the gospel of "labour and faith" sounded attractive enough when the New Jerusalem, painted in glowing colours as a land flowing with milk and honey, was declared free to all and within the reach of all. Such a message, backed by material assistance, and delivered with enthusiasm by men selected for their devotion to the prophet's person, could have but one result, and emigrants, drawn from the lowest and consequently most credulous classes, repaired by thousands to Salt Lake Valley. The movement had no specially religious stimulus whatever, but the proselytes were simply led, as in the case of other emigrants, by the hope of improving their condition in life. They were for the most part penniless, and of course utterly without the means of cultivating the portions of land on which they were settled upon their arrival in the Far West. It was Young who supplied every want of the new-comers, whether for building houses, or breaking up the soil, taking payment in liens on the various farms. Thus, from the moment of his settlement, the emigrant became the debtor, and practically the slave of the prophet, whose powerful character, aided by unfailing *bonhomie*, established an extraordinary influence, half fear half faith, over the partially developed minds of his people, who thought of him, not as a creditor, but as a beneficent being of supernatural powers in direct communication with the Almighty.

As a matter of fact however Utah became a prison ;

for though, by dint of constant labour, the Mormon farmer gained a livelihood, it was rarely indeed that he succeeded in discharging his obligations. To leave the valley, even if he wished it, was impossible without money; and purchasers of farms in a community burdened with debt and deprived of any surplusage by heavy Church tithes were few indeed. Young riveted these chains in many ways. The administration of justice, ostensibly a function of the Church, was practically in his hands and, like all spiritual tyrants, he wielded a secret system of espionage which kept him informed of everything passing even in the obscurest households. He disposed absolutely of a considerable military force and of the devoted services of a mysterious body called the "Avenging Angels," who secretly executed his decrees. Discountenancing the use of money, he made it a matter of religion to conduct all commercial transactions by barter. He prohibited mining in the neighbouring mountains, declaring that the tilling of the soil was the only work approved of by God. He even tried to introduce a Mormon language, in which if he had succeeded, the children of the original settlers would have lost the power of reading anything but Mormon literature. No schools, properly so called, were established, but only "ward-meeting houses," where the Book of Mormon formed the whole educational curriculum. While however the prophet aimed at producing mental stagnation among his people, he

took care that they were both occupied and amused. "Labour and faith" was the creed he unceasingly preached, but he made leisure agreeable by amusements and the drama. The theatre played a *rôle* only inferior to the tabernacle in New Jerusalem, where they worked, believed, and laughed, but did not think.

Given then, on the one hand, an isolated, credulous, and ignorant community, bound almost equally in the chains of superstition and poverty, and on the other, an able, suave, and unscrupulous autocrat like Young, whose hand of iron was never ungloved with levvet except openly to strike the foes of the commonwealth, or secretly to smite where he feared private danger, there is little to excite surprise in the general phenomena of Mormonism. With regard to its special feature, polygamy, Brigham created a fanatical community in spite rather than by means of this doctrine; and his ascendancy would perhaps have remained more unquestioned if he had never promulgated the "Revelation on Celestial Marriage." For the bulk of the Mormons were after all too poor to have more than one wife, and though the prophet probably pleased the priesthood, who lived in comparative wealth on the tithes, and whose co-operation was essential to his superstitious system, by the institution, his hold on the masses did not depend on the doctrine of plural marriage. The commonplace clay of which his bishops, elders, and prosperous traders were made, was no doubt well pleased to gratify passion

under the sanction of religion, but Mormonism as a system was weakened, not strengthened, by the introduction of polygamy. Within twenty years after its establishment there was serious insubordination in the camp. Young girls made vows against marrying polygamous husbands, and the children of first marriages treated the issues of later unions as illegitimate. Force and fear entered the community, creating a crisis whose gravity Young himself appreciated and whose end he perhaps secretly dreaded. After his death polygamy became a less prominent feature of Mormon faith, apart from which tenet however it would be difficult for any man intelligibly to formulate this strange creed.

All the world asks "What will be the end of Mormonism?" and some say "Why does not the American Legislature interfere to put an end to this scandal?" But, during the time when distant Utah was treated with the natural neglect already referred to, a great population of ignorant, bigoted, and credulous people has arisen, whom the Americans of to-day are much too wise to treat, whether lawfully or unlawfully, in the spirit of persecution. The soul of Mormonism died with Young, and its body is rotting. Gentile miners, whom Brigham hated, and while he yet had power forbade the territory, are raising twenty thousand dollars' worth of bullion a day in the Wahsatch range. Gentile traders have settled under the protecting guns of Fort Douglas, to supply the wants of these men. Gentile

newspapers are published. Gentile schools have been opened. Money has taken the place of barter. The rich mining men of Idaho and Montana come here to spend their winters agreeably, crowding the hotels, spending money freely, and unconsciously distributing ideas. Railways to the mining camps will follow, and by-and-by it will be found that the bottom has dropped out of Mormonism, before the world, or the Mormons themselves for that matter, are aware of it. Such is the view of the practical average Yankee, who has a boundless, if not noisy, faith in the gospel of selfishness, and who cannot conceive of a superstitious creed proving stronger than dollars. America believes that railroads, newspapers, and schools will prove more than a match for polygamy and priestcraft, and on this occasion will undoubtedly "let all things grow together till the harvest" which common sense will one day reap, even in Salt Lake Valley. But for the follies committed in Illinois in 1844 and 1845, a crowd of inconsequent sectaries could never have become important, or Brigham Young have risen to be a power in the state; but man, especially fanatical man, is so much wiser than his Maker that he always tries to improve on the methods of providence.

A dip in the dense brine of Salt Lake is a curious experience. Swimming is difficult, for the heels float above the surface and strike at the air, but one can sit in a natural posture in the water without making any

movement. A bathers' train runs daily to the lake, giving magnificent views of the Wahsatch range on the way, and carrying a crowd of saints, together with some sinners, who, in all sorts of becoming and unbecoming costumes, splash about in the limpid blue water till the locomotive shrieks a summons to the bank.

The hill-sides around Salt Lake are scored, like the Wahsatch range, up to great heights with many terraces, some conspicuous and others obscure, but all suggesting that the vast inland seas which covered Central America after the close of the glacial period have disappeared by gradual evaporation, the arid climate of a later period being even now engaged in draining the last drops of sweet water from the ever brinier depths of the great Salt Lake.

CHAPTER XXI.

LAKE TAHOE—VIRGINIA CITY.

August 10–19

LEAVING Salt Lake City, the railroad enters upon the great American desert, those desolate plains so well characterized by Bret Harte—

> "Alkali, rock and sage,
> Sage brush, rock, and alkali, ain't it a pretty page?
> Sun in the east at morning, sun in the west at night
> And the shadow of this 'yer station, the on'y thing moves in sight."

From Ogden to the feet of the Sierra Nevada the cars traverse a succession of old lake-beds, whose floors, now dry, are covered with a thin crust of alkaline efflorescence derived from the moisture of the subsoil, which, creeping upwards by capillary attraction and loaded with saline matter, evaporates on reaching the surface and leaves the deposit in question. Vegetation entirely fails in the desert basin, save for scattered bunches of sage brush, whose roots, holding the earth together, preserve the soil here and there from erosion by wind, and give rise to great hummocks, sometimes five or six feet high, upon whose leeward slopes the ragged sage branches huddle together. Life, like

vegetation, totally disappears, not even ants or prairie dogs being able to pick up a living in such a wilderness. The surface of the ground is parched and yellowish-brown in colour; there are no streams, and great rivers, like the Humboldt and Truckee, which rising in the snows of the Eastern Sierran slopes, lose themselves in the bitter and thirsty levels of the desert basin. The desolate scene is margined by high mountains, whose waterless flanks, bare of all vegetation, are terraced for hundreds of feet above the plain, every terrace marking a pause in the process of dessication which has deprived Western America of its ancient inland seas. A fine white dust, disturbed by the passage of the train, rises in clouds and covers everything within the cars with a thick alkaline coating, penetrating into trunks and portmanteaux, while dust-storms, shaped like water-spouts, travel slowly across the plain, looking like great whirling columns of smoke. Still, the desert basin is far from uninteresting to the traveller with an eye for geological changes. To him the dry sea-floors and terraced hill-sides suggest a far-distant time when Western America consisted of a group of islands, the summits of the present ranges, which, enjoying a moist and moderate climate, lifted their steeply sloping and densely wooded sides from a sea whose waters mingled with those of the Arctic Ocean.

After leaving Ogden, Indians were seen at almost

skinned passengers during this part of the journey. These were chiefly Shoshones and Piutes, contrasting most unfavourably in appearance with the clean and intelligent-looking Sioux whom we met in Chicago. The men were degraded-looking wretches, plentifully smeared as to their faces with red and yellow ochre, and dressed for the most part in blankets; while the women who, with babies strapped to their backs, squatted on the platforms begging, and eating such food as was thrown them from the cars, were as much like monkeys as human beings in their ways and movements.

The future of the American Indians is not difficult to divine. Everything favours their extinction, and nothing tends to prolong the life of this unhappy race. War, fire-water, disease, and cross-breeding with whites, perpetually diminish their dwindling ranks. America on the other hand is careless and unjust in her dealings with the red man, and too often allows the "agent" charged with his protection to become the grave-digger of his race. It is notorious that these officials grow rich by withholding from the natives goods which it is their duty, in execution of treaty obligations, to distribute. Annoyed at such treatment, a tribe, it may be, makes a formal complaint, and an inquiry is ordered at Washington. Under these circumstances and determined that no investigation shall take place, an agent has been known to represent the intervention of government as an act of hostility directed against the tribe. An Indian

attack or outrage follows, whereupon troops are ordered into the district, and a "little" war ensues, in the course of which a number of white men are scalped, and some white homes destroyed, but in the result the tribe is nearly exterminated, and the inquiry abandoned.

Twenty hours from Ogden the ascent of the Sierra Nevada commences, the railroad in the first instance following the course of the Truckee river, whose valley opens into smiling meadows soon after the desert plain is left, while pines again begin to cling to the mountain-sides. Before rising far, and when still some fifty miles from the summit, we stopped at Reno, and diverged thence to Carson City, lying about twenty miles south of the transcontinental route. From the desert levels surrounding this town we could see the bare brown summits of the Washoe chain, and beyond and above them the snowy peaks of the Sierra Nevada itself. On the other side of the nearer range lies Lake Tahoe, for which we took the stage at Carson, and clambering first to the Washoe summits, wound down thence through forests of magnificent Californian pines to the lake-shore. The axe, which has already stripped so many hills to supply the wants of Nevada mines, is busy among these glorious trees, and in a few years the green frame now encircling the lake will be destroyed, and one of the most beautiful bits of scenery in the world robbed of half its charm. A great saw-mill has been established

quantities by a mountain railroad to the Washoe summit, where it is thrown, stick by stick, into a snow-fed flume, or trough, which winds along the mountain-sides, sometimes by gentle slopes, sometimes in steep inclines, to Carson City. A constant stream of logs is thus delivered to the great lumber-yards of that town, twenty miles distant, and, as the flume follows the stage road for the greater part of that distance, the operation is frequently in view from the top of the coach. It is curious to observe that upon steep inclines the logs travel faster than the water in the flume. The falling fluid is retarded by friction against the sides of the trough, but the baulks of timber, travelling with the water, suffer no such retardation, and consequently, where the descent is rapid, drive the lagging liquid in a wave before them, spilling it over the edges of the trough.

A famous mountain driver, named Hank Monk, handled the lines on the day of our making the journey; the same man who once gave Horace Greeley a terrific ride from the summit of the Sierra down to Placerville, a mining town in the western foot-hills, where the philosopher-politician was going to give an address. The road was bad, the time short, and Greeley became not a little anxious about his arrival, as the stage crept slowly up the mountain-side, but once on the down grade, Monk drove at such a headlong pace that his distinguished passenger thrust his head again and again out

every caution being "Keep your seat, Horace, keep your seat; I'm agoing to get you there on time."

Lake Tahoe is perhaps the most beautiful sheet of water in the world. It lies on the eastern flank of the snowy range, about six thousand feet above the sea, in an oblong trough-like bed, parallel with the axis of the mountain chain; a very unusual position for a valley. To say that Tahoe is embosomed in mountains would be to use a figure better suited to the lakes of Italy than to this, which is more correctly described as buried in the range, whose crests rear themselves as much as three thousand feet above its surface on either side. The lake is a sheet of transparent water, green where shallow, and azure blue where deep, set like emerald and turquoise in the glittering silver of snow-clad peaks. The sky that overhangs it is cloudless, and rain in summer is unknown; the surrounding rocks are of grey granite which give a cold look to the scenery, except when the last rays of sunset, or the first of sunrise, light them up with the splendid tints of the "Alpen-glow." The great pines which fringe the shores and clothe the mountains give a peculiar beauty, but add little grace to the landscape, their foliage, though dark green near at hand, looking ashy grey on distant hill-sides. Many of these glorious trees are seven or eight feet in diameter and tower up to heights of two hundred feet and more, while the largest of them cannot be less than a thousand years old.

We quartered at the head of the lake in a rough but comfortable hotel kept by a character named Clements, universally known throughout the neighbourhood as "Yank." He came here more than twenty years ago, when both California and Nevada were full of Indians; took in land, and built himself a board house, which, now that Tahoe is visited for its beauty, has grown into a rambling tumble-down hotel, standing on the edge of the lake and surrounded by gigantic pines. Among the last, the white tents of summer "campers" are scattered, and at night, when a score of camp fires are lighting up the red stems of the trees, it is both picturesque and pleasant to stroll, always a welcome guest, from one forest home to another, admiring the fickle illumination of the trees, and chatting, here with a trout-fisher, there with a grouse-shooter, or again with a family party spending its holiday under canvas.

Once a week Yank gives a "ball," when people who look like artisans, but may be mining millionaires, arrive with parties of gay wives and gayer daughters, in wonderful buggies, drawn by still more wonderful four-horse teams. As evening approaches, neighbouring ranchmen; folks from the saw-mill; others from Tahoe City—a town on the lake, of at least a dozen houses—and Yank's male helps appear, "fixed" for the occasion. The dignified young person who waits at table in a wide hat and Dolly Varden dress gets into

their portmanteaux for something more becoming than tweed suits; and the band, arriving in excellent time, is importuned to take drinks. The ball-room is built expressly for dancing, having a spring floor which plies in the centre, while a fixed margin, three or four feet wide, is left for the chaperones, if such things are in the West, where they may sit "solid" while the gay crowd is gently heaving like ships on a quiet sea. Etiquette, as at the Denver "social hop," is strictly observed, and behaviour is as punctilious as in a London drawing-room; while for real enjoyment I would back these light-hearted pleasure-loving westerners against even the French themselves.

We take our meals at Yank's in a bare boarded room, and sleep on bare boards cunningly disguised with blankets; the kitchen and Chinese cook are conspicuous parts of the establishment, and we see our dinner daily cut from a tough buck hanging on a pine branch outside. The ranch-helps and grooms, lounge independently, and spit casually about the piazza. The campers, in shirt-sleeves and high boots, drop in now and then for drinks and friendly conversation, and Yank himself lays wait for us in the bar, to tell for the fiftieth time an endless yarn beginning with "I settled this valley two and twenty years ago," at the sound of which words experienced men have been known to leave the most seductive cocktail and fly. But life is a thing to be thoroughly enjoyed at Yank's landing. A morning

swim in the cold blue water, is followed by a tramp to some neighbouring Sierran summit, or to one of the smaller lakes with which the district abounds. Or we shake out a sail and troll for great trout, or, boarding the pleasure steamer which calls daily at the primitive pier, make a tour of the whole lovely lake. At night, failing a "ball," we stroll through the lighted forest, or chat with the campers, lying on couches of odorous pine needles, with eyes that wander from the flashing camp fires up the dark shafts of stately trees to the quiet stars shining out of a violet-black sky.

From Yank's we made the ascent of Mount Tellac, a peak ten thousand two hundred feet above sea-level, lying east of the Sierran summit and somewhat lower than the crest of the range. This mountain is glaciated from the bottom almost to the top, exposing in some places acres of bare white granite, polished like a mirror, and reflecting the sun's rays dazzlingly. From its shoulders, two lateral moraines, gently graded and symmetrical as railway embankments, sweep down to Lake Tahoe. No model, contrived for the purpose, could better illustrate the former existence of a glacier on the flanks of Tellac, while, as if to make the picture of what has been more complete, masses of snow, lying between the dark walls of the lateral moraines, simulate the vanished ice-flow. The number of butterflies, and variety of wild flowers met with during the ascent surprised us not a little. The former were fluttering

gaily on the very summit of the mountain, and we gathered no less than thirty species of flowering plants, to say nothing of ferns which were almost equally numerous, on the way. Such snow as remained unmelted varied from a few feet to a few yards in thickness, and was tinted here and there at the higher elevations with bright pink patches, for which, in the probable absence of the Arctic snow fungus from such a locality, we could in no way account. The view from the crest, looking west, embraced a magnificent line of the Sierran peaks, while southward we were hemmed in by lower, but still snowy, spurs of the main range, and eastward, the eye ranged away to the Carson Desert. Although the sun was extremely hot we suffered no inconvenience from his rays, so cool and dry is this mountain air, but a natural spring of sparkling soda water, occurring by the way, found favourable critics both on the upward and downward journey.

Nevada is the greatest mining state in the Union, and Virginia City, its capital, the greatest mining city in the world. It lies among the foot-hills of the Sierra at an elevation of six thousand two hundred feet, on the eastern face of Mount Davidson, whose summit is seven thousand seven hundred feet above the sea, and is separated from Tahoe by the Washoe range, over whose crest we climbed on our way to the beautiful lake. The city clings so closely to the flanks of the lower hills that

the Sierran summits lying to the westward are hidden, but eastward, the landscape is made up of innumerable interlocked mountains, conical in outline, red-brown in colour, and perfectly bare of all vegetation. These stretch as far as the eye can reach to where the snowy tops of the Humboldt peaks stand against the sky, and the terrible sterility of the scene is enhanced, rather than relieved, by the thin meanderings of the Carson river, whose course is marked by a narrow green line, looking like grass from the city, but really consisting of cotton-woods. This is the only sign of water visible in the arid panorama, whose bare red cones are steeped all day in dust haze, and lighted for a few moments at sunset by an "Alpen-glow" which dyes the countless peaks in as countless gradations of rosy light. Through this labyrinth of interosculating hills the railway from Carson to Virginia City is built; not following the course of a valley as railways usually do, but skirting the hill-sides like a contour-line on a map, and sweeping around them in great S-like curves, which sometimes almost return upon themselves in joining two points, scarcely more than a gun-shot asunder, but parted by a valley perhaps a thousand feet deep. The valleys are as dry as the hills, and though the country has evidently been shaped by the action of running water, the streams have all completely disappeared. The mountains are of volcanic origin, and the railway cuttings expose rocks of the most varied and brilliant tints,

sometimes dark purple, sometimes bright red in colour.

Virginia City began to be a town in July 1859, when silver was first discovered by two Irishmen in the Ophir Mine, and the rush from California which ensued, on the find becoming known in that state, soon made the now world-famous Comstock Lode a busy place. A straggling village of canvas houses, tents, and brush shanties grew up at once; before a year had passed, adobe and brick buildings began to make their appearance, and the bare slopes of Mount Davidson were soon whitened with the dwellings of a great camp. This was totally destroyed by fire in 1875, after which the place was systematically rebuilt, and is now a handsome town numbering about twenty thousand inhabitants. Virginia City is more orderly, cleaner, and better kept than many eastern cities; while the crowd which fills its well-paved streets, though cosmopolitan to the last degree, is prosperous, well dressed, and well behaved. It comprises keen-faced Americans, in store clothes and stove-pipe hats; Chinamen, in pig-tails and blue and black blouses; Piute and Washoe Indians, in paint and rags; hard-headed Cornishmen, with, here and there, a wild Mexican; but, totally unlike Leadville, Virginia City looks as finished as New York or Philadelphia, its dwellings and the mills connected with the silver-mining industry being remarkable for a neatness and order,

The Comstock Lode extends through the whole length of Virginia City and for some miles on either side of it. This great "fissure vein" varies from twenty feet to three hundred feet in thickness, and yields quartz containing both silver and gold. The shafts are very deep, averaging from thirteen hundred to fifteen hundred feet, but there are some which are sunk vertically as much as two thousand five hundred feet below the surface. The mineral vein is the richest in the world, having yielded more than £60,000,000 worth of gold and silver since its discovery in 1859; and two shafts in particular, the Consolidated Virginia, and California, called the "Bonanza" mines, yield together nearly six and a half millions of the precious metals annually.

The operations of the Comstock Lode are unusually interesting on account of the extraordinary perfection of the appliances used, both above and below ground, which, together with an admirable organization, offer a striking contrast to the primitive machinery and unsystematic management of mines in general. Excellent permanent buildings contain the hoisting machinery and engines for winding and pumping. The former consist of large drums, provided with well-considered arrangements for indicating the position of the cages throughout their ascent and descent, together with scientific signalling apparatus; the whole being of excellent workmanship. The winding-engines are the best that can be procured; powerful, easily controlled, and trustworthy. Ordinary

pumping-engines have proved unsatisfactory in raising water from such great depths, and, as "a stop costs more than an engine" in these deep mines, the ingenuity of the best American engineers has been taxed to produce the splendid motors in use for this purpose. The only fuel in Virginia City is wood, and, the sources of supply being distant, this is dear, so that all these fine engines have been built as much for economy as efficiency, and are provided with scientific valve-gear for reducing the expenditure of steam to a minimum. The miners descend the shafts in iron cages, each of which carries twenty-seven men. These are fitted with safety catches, and lowered by wide iron bands, instead of ropes or chains, and so perfect are all the arrangements for this important service that no accidents have ever occurred. Indeed it is impossible to admire too much the overground machinery of the Bonanza mines, and the same remark applies underground, where compressed-air engines, steam and air drills, blowers for ventilating heated drifts, and every device that skill can suggest, whether for the easier extraction of ore, or the miners' safety, is found in operation.

The Comstock mines form a sort of underground city, whose numerous drifts and cross-cuts intersect each other like the streets of a town; and, like them, they are paved with planking, and lighted by lamps. The heat in the workings is very great, averaging 130° and reaching in some places 157° Fahr. Labour in these tempera-

tures is extremely exhausting, and for new hands painful; but the men get acclimatized after a few weeks and remain in the mines for the four-hour shift without serious discomfort. They drink large quantities of iced water while at work, and four or five tons of ice a day are consumed in the Consolidated Virginia Mine alone. Large and convenient dressing-rooms, fitted with baths, are provided for the miners, each man has a locker for his clothes, and everything in this department is kept in "apple-pie" order. At the time of a shift, the men congregate from the dressing-rooms in the hoisting-house, and, at a given signal, file with soldierly regularity by threes into the cage. When a cage has received its full complement of twenty-seven, a bell rings; the great winding-engine begins to turn, and the cage sinks rapidly down; while the mouth of the shaft, which is guarded by a substantial railing, is closed at the same moment. For the visitor who does not object to losing a few pounds' weight by perspiration, a trip to the lower levels is interesting. There is not much to be seen, but the pit is "full of noises;" and the reports of blasts fired in rapid succession, the bark of the air-engines, the roar of the blowers, the rumble of the cars, the rattle of the pumps, and heavy falls of ore in the chutes, lend an air of mysterious activity to the dim scene.

The quartz of the Comstock Lode contains both silver and gold, and is called "free milling ore," because

it does not require to be desulphurized by roasting, but goes at once to the stamps. These convert it, by pounding with water, into liquid mud, which, after being strained through fine wire gauze, runs by a long wooden flume to the "pan-mill." This is an independent establishment, where the precious metals are recovered by amalgamation, and run into "unparted" ingots, or blocks containing a mixture of silver and gold, in which condition they are sold to the mint. The silt flowing from the stamps is ground for several hours between iron millstones with sulphate of copper and common salt, and when the silver sulphurets of the ore have been desulphurized by the action of these chemicals, mercury is added to the mass, and the grinding continued until the precious metals have amalgamated with it. The semi-fluid mud is then transferred to a "settler," where the amalgam, by reason of its greater weight, sinks to the bottom of the vessel. Thence it is drawn off into canvas bags, through which the free mercury is squeezed by hydraulic pressure, leaving a semi-solid residue, composed of one part bullion and four parts quicksilver, in the bag. Finally, the amalgam is heated in a retort until all the mercury has been driven off in vapour, and the pure bullion is then melted and run into ingots; the quicksilver being recovered in a metallic condition by condensation.

The pan-mill works for hire, receiving nine dollars a ton for milling, and being bound to return seventy per

cent. of the declared assay value of the ore operated upon. In practice it usually returns eighty per cent., and, if the pan-miller takes great care that his operatives do not steal his amalgam, he nets large profits from the business. The larger mills grind from three hundred to five hundred tons of ore per week, and employ from seventy to a hundred hands, each of whom earns from three and a half to four dollars a day. Like everything else connected with the Comstock industries, the pan-mills are models of efficiency and order. Their engines and equipment are of the highest class, the shops and yards are neatness itself; even the rubbish-heaps are tidy, while the operatives, whether in the mills or the mines, are an orderly, respectful, and self-respecting body of men.

Virginia City does honour to the rich mine-owners who direct and control the operations of the Comstock Lode. They have imparted a spirit of enterprise, economy, and order, both to the municipality and the workshop, such as I have never seen in any other industrial town, rarely in any private establishment, and which certainly does not exist in any other mining district in the world. The credit of all this belongs to the "Bonanza kings" Mr. J. W. Mackay and Mr. J. G. Fair, gentlemen who, although they probably do not know how many millions of dollars they are worth, are as energetic and attentive to business as if they were struggling men. There is perhaps no industry whose methods and

appliances are generally so rude and unscientific as those of mining, and it is therefore all the more a delightful surprise to the engineer, to find how royally his craft is entertained by the silver kings on the remote hill-sides of the Sierra Nevada.

CHAPTER XXII.

SAN FRANCISCO.

August 20–31.

RETURNING from Virginia City we slept for a night at Truckee, a station on the Central Pacific Railroad, fourteen miles from the summit of the Sierra Nevada. Here the night was cold and frosty, but the sun rose hot and bright as usual. The Truckee river runs out of Lake Tahoe, and, flowing eastward through a deep picturesque cañon, is finally lost in the sands of the desert basin. The railway follows its course to "Summit," the ascent beginning at Wadsworth, where, as already mentioned, the alkali plains are exchanged for mountain slopes, diversified by streams and scattered groups of pines. Between Truckee and Summit, and for many miles beyond the latter point, the track is covered by snow-sheds, which are almost continuous for nearly forty miles on one or the other side of the divide. Summit is not more than seven thousand feet above sea-level, but so much more snow falls in the Sierras than among the Rocky Mountains, that the railroad not

only requires protection from avalanches but is obliged to avoid the cañons, which are liable to be blocked by heavy drifts. Hence, as in the case of the road from Carson to Virginia City, the track descends from Summit by skirting the hill-sides, thus giving magnificent views of densely wooded mountain slopes, and affording occasional dizzy glimpses into gorges, two and even three thousand feet below the road.

The Sierra Nevada is by far the grandest of the many mountain chains which, folded in broad corrugations, form the western margin of the continent of America. In the words of Mr. Clement King, it is "a long and massive uplift, lying between the arid deserts of the great basin and the Californian exuberance of grain-field and orchard; its eastern slope is a defiant wall, plunging abruptly down to the plain; the western, a long grand sweep, well watered, and overgrown with cool stately forests; its crest a line of sharp snowy peaks, springing into the sky and catching the 'Alpen glow' long after the sun has set for the rest of America. For four hundred miles the Sierras are a definite ridge, broad and high and having the form of a sea-wave. Buttresses of sombre-hued rock, jutting at intervals from a steep wall, form the abrupt eastern slopes; irregular forests, in scattered growth, huddle together near the snow; the lower declivities are barren spurs sinking into the sterile flats of the great basin. Long ridges of comparatively gentle outline characterize the western side,

but this sloping table is scored from summit to base by a system of parallel, transverse cañons, distant from one another often less than twenty-five miles. They are usually two or three thousand feet deep, falling at times in sheer smooth-fronted cliffs, again in sweeping curves, like the hull of a ship, again in rugged V-like gorges, or with irregular hilly flanks, opening, at last, through gate-ways of low rounded foot-hills out upon the horizontal plain of the San Joaquin or Sacramento. Every cañon carries a river, derived from constant melting of the perpetual snow, which threads its way down the mountain—a feeble type of the vast ice streams and torrents that formerly discharged the summit accumulation of ice and snow, while carving the cañons out of the solid rock.

"The western descent, facing a moisture-laden aerial current from the Pacific, condenses on its higher portions a great amount of water which is piled upon the summits in the form of snow, and is absorbed upon the higher plateau by an exuberant growth of forest. This prevalent wind strikes first on the western slope of the coast range, a chain of hills of no great elevation, skirting the very margin of the Pacific, and there discharges a very great sum of moisture, but, being ever reinforced, it blows over their crests, and, hurrying eastward, strikes the Sierras at about four thousand feet above sea-level. Below this line the foot-hills are oppressed by an habitual dryness, which produces a rusty tone throughout the large conspicuous vegetation

scorches the red soil, and, during the long summer, overlays the whole region with a cloud of dust. Dull and monotonous in colour, the oak-clad hills of this lower zone wander out into the great plain-like coast promontories enclosing bays of prairie. Above this zone of red earth, with its softly modelled undulations and dull grey groves, its chain of mining towns, and scattered ranches and vineyards, rise the swelling middle heights of the Sierras, a broad billowy plateau, cut by sharp, sudden cañons, and sweeping up with its dark, superb growth of coniferous forest to the feet of the summit peaks.

"Strikingly contrasted are the two countries bordering the Sierra on either side. Along the western base is the plain of California, an elliptical basin four hundred and fifty miles long by sixty-five broad; level, fertile, well watered, half tropically warmed; chequered with farms of grain, ranches of cattle, orchard, and vineyard, and houses of commonplace opulence, towns of bustling thrift. From the Mexican frontier on the other hand, up to Oregon, a strip of actual desert lies under the east slope of the great chain, and stretches eastward, sometimes as far as five hundred miles, varied by successions of bare white ground effervescing under the hot sun with alkaline salts, plains covered by the ashy-hued sage plant, high, barren, rocky ranges which are folds of metamorphic rocks, and piled-up lavas of bright red or yellow colours; all overarched by a sky which is at one time of hot metallic brilliancy, and, again, the tenderest of

evanescent purple or pearl." Between these two regions, lifted equally above the bustling industry of the plains and melodramatic mining theatre of the foot-hills on the one hand, and the stark, glaring desert, with its chains of bare and corpse-like hills on the other, shine the white peaks of the High Sierra, their heads bathed in the ethereal blue, their feet swathed in dark luxuriant woods.

At last, the summit of the Sierra Nevada crossed, we were in California, the land of romance, whose treasures are guarded by entrances as wonderful as the gates of a true fairyland. From Summit to Sacramento is rather more than a hundred miles, and, within that distance, the train descends from an elevation half that of Mont Blanc, almost to sea-level; passing successively through the splendid forest belt of the Sierran flanks, the arid foot-hills of the range, and finally emerging into the valley of the Sacramento river, whose wide flats form one great grain-field. At Summit the traveller shivers in an over-coat, but he learns how shrewdly the sun of California bites before reaching the plain, where, however, the transparent air and vibrating light of the great altitudes disappear; the horizon becoming lead-coloured, and the sky soft, while the atmosphere recalls the pearly air of Holland.

The valley of the Sacramento is thickly dotted with wealthy homesteads, well built and comfortable looking, like the farmhouses of Lincolnshire, and frequent wind-

mills help to remind us of the English fen country. Harvest is over, and wheat in bags lies at every railroad depôt, or piled in the fields where, though not under cover, it is safe from rain which is quite unknown at this time of the year. Here and there, lie the great "headers," or reaping-machines, twenty feet wide, which take off only the ears of the grain and deliver them to the thrashing-machine while the cutting proceeds. Elsewhere stand immense mounds of straw, useless except as fuel for the straw-burning steam-engine, and waiting a favourable calm to be fired and destroyed. The cultivation throughout the Sacramento Valley alternates between wheat and lucern, or "alfalfa" grass, but grain is often grown for many years in succession. The soil is a rich alluvium which carries heavy crops sometimes amounting to fifty or sixty bushels per acre. The farms, contrary to the rule in America, are very large, holdings of twenty and even forty thousand acres being no uncommon thing. These great tracts of land are for the most part held under Mexican titles, many of which have doubtless had rather shady origins, but at the close of the Mexican war the United States Government respected the rights of owners in possession, and great farms remain the rule in the valley of the Sacramento.

The San Joaquin and Sacramento rivers enter the harbour of San Francisco together by the Straits of Carchenas, across which the train is ferried, a distance of nearly three miles, on a huge steamboat. This vessel is

four hundred and fifty feet long and a hundred and thirty feet wide, and on her deck are laid four lines of way which can accommodate as many as fifty cars at a time. The train is put on board so easily, and the transit made so quietly, that a stranger, crossing at night, would hardly be aware of anything beyond a long stoppage having taken place. Leaving the Carchenas Straits, the railway skirts the eastern shore of San Francisco harbour, a long, narrow, and lakelike expanse of water, landlocked by the hills of the coast range, except at one point, where the Golden Gate opens its narrow and rocky portals to the Pacific. On the southern jamb of this continental doorway stands the city of San Francisco, facing the enclosed harbour, and climbing thence backward up the steep slopes of the hills which separate the anchorage from the ocean.

Arrived at Oakland, a flourishing suburb of the western metropolis, situated on the eastern side of the harbour, we left the train, which pursues its way southward to San José, and crossed, in a great ferry-boat, to the city. A fleecy fog was flowing in through the Golden Gate, the sun, no longer brilliant as at the great altitudes, or glaring, as on the plains, shone with a soft delicious lustre, the air was cool, almost cold, and the white buildings of the city of romance stole out of the mist as we advanced. We had good reason, as we well knew, to enjoy the temperature. Fifty miles inland the cultivated plain was reeking in tropical heat; fifty miles

farther back, the arid foot-hills were lying, like the corpses of a once living land, buried in hot red dust; and still fifty miles farther eastward, the white teeth of the Sierra were chattering in the snow. Meanwhile, for us, a cool exhilarating wind was blowing, and a sun, as much silver as gold, shone from a sky of pearl. The westerly wind blows steadily and continuously from the Pacific, loaded with fog, with which the sun struggles daily at San Francisco, sometimes with more, sometimes with less success. The solar rays are thus tempered during the summer, while, in winter, the aerial current brings the warmth of the Pacific to the city, which then enjoys the temperature of an English May. Fires are not needed at any time of the year, but an overcoat is pleasant both morning and evening all the year round. Frost is almost unknown, and the whole city turns out to look at a hailstorm.

The history of San Francisco covers a period of only thirty-five years. A house was built where the city now stands in 1835, around which, in the course of time, a small Californian village, called Buena Yerba, sprang up. The Americans changed this name to San Francisco in 1847, and the population in 1848, just prior to the discovery of gold, was a thousand souls. About half of this number were Americans, who, on the termination of the Mexican war, came here either to trade or take up land in the Sacramento Valley; the rest were Californians. The native houses were of unburnt bricks, and their

owners were quite Spanish in appearance, wearing high steeple-like hats, jackets of gaudy colours, and velvet breeches. Cattle-breeding was the only industry, and the surrounding hill-sides were dotted with scattered ranches, whose white buildings and garden patches were the only visible signs of man in an otherwise desolate country. The farmhouses were built of stakes, driven into the ground, and interlaced with boughs, plastered with mud, and whitewashed. The interior was bare and cheerless, the soil, beaten hard, formed the floor, the furniture comprised only the simplest necessaries of life, and a few gaudily coloured prints of saints were the only ornaments.

In 1848, Colonel Mason, the first American Governor of California, was stationed with a few troops at Monterey, a small town upon the coast south of San Francisco, whence he directed the affairs of the newly acquired and sparsely populated territory. On the 8th of May in that year a rumour came to San Francisco that gold had been found in the American river, a tributary of the Sacramento, about a hundred miles inland. For two days nothing was talked of in the little place but the new gold "placer," as the half-Spanish natives called it, and, on the 10th, some ardent spirits had already started, pick and pan in hand, for the diggings. Before a week was over San Francisco was in a *furor* of excitement. All the workmen had struck, ships in the harbour were deserted by their crews,

and storekeepers, merchants, lawyers, mechanics, and labourers alike, were making preparations for moving on the American river. By the end of another week the fever reached and decimated Monterey, Colonel Mason's soldiers deserting and joining the rush. It was at first supposed that Mason would take possession of the mines on behalf of the United States Government, but, if such a course was ever contemplated, it could not have been carried out because his force was insufficient, and he could not keep his men together; while, in addition, it was soon ascertained that the gold occupied many miles of ground, and was not confined to any particular place. Within a fortnight of the news first arriving in San Francisco, the town was practically emptied of its inhabitants, only a few of the longer heads remaining to organize means for supplying the various wants whose early growth and immense extent they had the sense to foresee.

The actual discovery of gold was made by a Mr. Marshall who had built a saw-mill on the American river, a few miles above its junction with the Sacramento, for a settler named Sutter, whose farm lay on the banks of the latter stream. In May, 1848, Marshall had occasion to widen the tail-race of the mill, and, with this view, he let the whole of the water in the dam through the channel at once, thus enlarging the passage-way, and carrying off a mass of detritus by the force of the torrent. Next morning, while walking along the newly crumbled

bank, Marshall saw something glittering among the rubbish, and, to use his own words, "I debated within myself whether or not I would take the trouble to bend my back and pick it up. I had decided on not doing so when another glittering morsel caught my eye which I condescended to pick up, and, to my astonishment, found it was a scale of what appeared to be pure gold." While beginning actively to dig and wash for the treasure thus discovered, Sutter and Marshall vainly tried to keep the find a secret, but the report soon spread, and crowds of people flocked from San Francisco, Monterey, and the various ranches, to the Sacramento and American rivers. A pioneer party of Mormons entered California just as the affair became known, and, halting at once, commenced operations which were soon reported far to the eastward of the Sierra Nevada. What followed on Marshall's discovery is now matter of history. The adventurers of both worlds rushed to the new El-Dorado, and, whether across the then trackless deserts and mountains, or by the gate which opens seaward on the golden land, a surging stream of turbulent men of all nationalities overflowed California, which had hardly yet passed into the hands of the United States, and was still so distant and dissevered from the central authority that executive government was powerless to control its new subjects. If, under these circumstances, anarchy prevailed for a time, and life and property were held by the pistol, it is not to be wondered at. The marvel is

that out of such elements as constituted society in the "early days" of California, order ultimately, and, to a very great extent, spontaneously arose.

In the mean time San Francisco, the natural centre of the territory, grew rapidly. At the time of the gold discovery its population, as we have seen, was not more than a thousand, but two years later, when the influx from the east and Europe had fairly commenced, it contained twenty-five thousand inhabitants. Since that date (1850) it has doubled its numbers in every succeeding ten years, and now contains nearly three hundred thousand souls. The city was incorporated in 1850, but municipal government was for some years so bad, and the administration of the criminal laws so corrupt, that vigilance committees were at length organized who summarily executed or banished the worst offenders without judicial formalities. Judge Lynch, however, resigned in favour of lawful tribunals in 1860, and, at the present moment, but for some acts of violence against the Chinese, too much in vogue unhappily elsewhere, San Francisco might be called one of the most orderly towns in America. The gold which created it has long since been washed out of the Californian foot-hills, and the successors of the lawless "forty-niners" are peaceful growers, of wheat wine, and fruit, and importers of lumber, coal, coffee, tea, rice, and sugar, while local manufacturers already begin to supply their general wants.

The city is beautifully situated with its back resting on the hills of the Coast range which separate it from the Pacific, and its face turned towards the lake-like harbour, beyond which rise the mountains of the Contra Costa range. The streets are rectangularly arranged, as usual, and the houses are generally of wood, painted white, and always furnished with bay windows, to catch as much sun as possible. All of them have some pretensions to architectural beauty, and there are a number of mansions, belonging to wealthy men, which, though built entirely of pine, rival the finest dwellings of London or Paris. No American city is so un-American as San Francisco. Its population is extremely cosmopolitan, and contains only a small proportion of native Americans. The people speak without a nasal twang, and, new as it is, the town is more finished and homelike than the older but cruder eastern cities, which interest, but do not charm, the visitor from Europe. If a delicious temperature, abundance of fruits and flowers, dainty cleanliness, streets quaintly diversified by Chinese houses and dresses, shops displaying, in addition to much excellent native art, the treasures of Japan and the far East—if these things make a city pleasant, San Francisco is a pleasant town. Then the place is redolent of mining romance. The neighbouring foot-hills are still dotted with camps such as those which Bret Harte has invested with a melodramatic interest. The palaces of California Street, to which reference has

already been made, belong to men who were miners yesterday and are millionaires to-day. A sanguine, light-hearted, and courageous people, who know how to *reculer pour mieux sauter*, throng the streets. The very nursemaids hope to become rich by lucky investments of their savings in mining stock. There are no old men or women, but every one is in his first youth, and the "Queen's English" is spoken more generally than usual in the States.

The Coast range, to which allusion has already been made, forms the extreme margin of the continent, and stands with its feet in the Pacific Ocean. It is the western, as the Sierra Nevada is the eastern wall which flanks the valleys of the Sacramento and San Joaquin; but it is neither so high nor so massive as the Snowy Range; its loftiest peaks being under five thousand feet in elevation. The two ranges join both towards the north and south, and completely enclose the plain of Central California, which has already been referred to as an elliptical basin of fertile flats nearly thirty thousand square miles in extent. The Coast ranges were elevated at a later period than the Sierra Nevada, and have suffered great disturbance in very recent geological times. None of their rocks are older than the chalk, and most of them are composed of soft tertiary deposits, which have weathered into mountain forms possessing outlines of peculiar softness and delicacy. These are made conspicuous by the general absence of vegetation, which

hides in the cañons, or sometimes crowns the crests of the hills, but leaves the hill-sides quite bare.

While such is the character of the scenery surrounding the bay of San Francisco, no pen, and scarcely any brush, could faithfully represent the peculiarly beautiful atmosphere which invests the landscapes of the Coast range with an altogether indescribable charm. On days when there is no fog, the panorama from Telegraph Hill, one of the highest points in the city, is magnificent. The lake-like bay, lost at either end among the windings of the hills, lies at the observer's feet, and joins the misty Pacific by the narrow opening of the Golden Gate. This rocky portal is a precipitous gash in the Coast range, whose bare, red, and softly outlined hills run north-west and south-east, meeting at either extremity of the bay the mountains which hem in its opposite and not distant shore. The latter constitute the Contra Costa range, at whose feet, fronting San Francisco and lining the water's edge, shine the white houses of Oakland, San Antonio, Alameda, and San Leandro, forming an almost continuous line of towns more than ten miles in length. Behind the Contra Costa range rise the twin cones of Monte Diablo, bounding the eastern outlook; while westward, at the back of the observer, the city itself reposes on the flanks of the Coast range which narrowly separates it from the ocean. The scene, fine in itself, is informed with magical beauty by the colouring, to attempt a description of

which is like trying to seize the very atmosphere whose peculiar quality gives to each distance a new tint of amethyst or opal, softer and sweeter than any words can paint.

Gold, as we have already seen, first led the Californian "forty-niners" into a country which well repays cultivation. Of its vast wheat-fields I have already spoken, but wine and fruit are only second to breadstuffs in commercial importance on the Pacific slope. The vine thrives admirably in California, and, although native Americans are too impatient of careful industries and deferred profits to become wine-growers, the Germans are on the way to make the valleys north of San Francisco rivals of France and the Rhine. Excellent white and red wines are already grown in the Napa and other districts, and the demand, which is constantly increasing, is already larger than the supply. It would become overpoweringly so if the Americans themselves drank native clarets, hocks, and champagnes; but it is the fashion to prefer foreign wines to the home productions. This state of things, based as it is on mere affectation, will only be temporary, but in the mean time the Californian wine-grower has to seek a European market. As, however, a great deal of his wine goes to Hamburg, there is probably more of it drunk, under French names, at ostensibly fastidious Eastern dinner-tables, than is generally supposed. We visited the well kept and extensive cellars of Mr. Lachman, and found his hocks and

clarets excellent, but the ports and sherries were as luscious as liqueurs; these however find a ready sale in Central America, though they are much too cloying for our taste. The grape was introduced into California by the Spanish Jesuit missionaries who, like the French in the north-west, were early labourers in this field for the conversion of the natives. Wine made from the "mission grape" is however thin and poor, and a vine much better suited to the soil and climate is now generally grown. The wine trade suffers at present from the characteristic American hurry to get rich. The growers are not capitalists, and neither care, nor can afford, to mature their wines before throwing them upon a greedy market. The growth of a home demand will remedy this evil by stimulating with high prices the practice of keeping wines, and nothing but American consumption is wanted to give an enormous development to this already important Californian industry.

Fruits and vegetables of all kinds grow most luxuriantly on the Pacific slope. Peaches and apricots were selling wholesale at twopence a pound during our visit, but the former in good years are not worth more than a halfpenny a pound. "Bartlett" pears, similar to our jargonélles, cost three halfpence a pound, and black Hambro' and Muscat grapes twopence a pound, melons of seven pounds weight are sold at twenty-five shillings the hundred, and water-melons may be had for asking.

With fruit at such prices, canning has become an

important trade, and, although confined chiefly to peaches, pears, and apricots, employs nearly three thousand people in California. This industry is carried on in factories, sometimes employing several hundred hands. Women peel and halve the fruit in the first instance, and throw the slices into tubs of water, which is constantly being renewed. Other women pick up the slices, rejecting all the bad ones, and pack them carefully in tins which, when full, are hermetically closed and boiled for ten or fifteen minutes. Leaky cans are discovered by their bubbling during this process, and the sound ones are pierced, each with a tiny hole in the cover, from which steam and air rush violently out together in a small jet. The hole is closed with solder while vapour is still issuing, and, a vacuum being thus secured, the cans, when cool, are ready for labelling and despatch. There are ten large fruit-preserving establishments in San Francisco which confine their attention solely to canning, leaving the French in possession of the trade in high class "glass goods," no fruit being put up in bottles in California because there is no fine white glass made in the western states, or indeed, thanks to the protective system, in America.

Six miles from San Francisco is the "Cliff House," a favourite pleasure resort of the citizens, standing on the shore of the Pacific immediately opposite the famous "Seal Rocks." The road to it lies over great hills of blown sand, now being reclaimed and converted into a

beautiful park, but the Pacific coast when reached proves extremely disappointing. The sea horizon is rarely visible on account of the fog, and mild waves of by no means translucent water break on a desolate shore whose sandy levels stretch tamely away on either hand into misty obscurity. The ghosts of ships steal out at intervals through the Golden Gate, but neither these nor the curious Seal Rocks, with their strange population of basking and roaring sea-lions, give animation to the "vicinity of a melancholy ocean."

Newspaper advertisements soon make a visitor aware that spiritualism is a great cult in San Francisco, the number of clairvoyants, mediums, and "spirit healers" who parade their supernatural powers being legion. Many of these people have a regular *clientèle*, who attend their *séances*, especially on Sunday evenings, just as a congregation might meet for religious service. The handsome rooms and residences in which these reunions take place testify to the profitable character of the spiritual business, while the attitude of the medium towards his, or her, visitors, proves how much consideration the profession enjoys. We joined a noted circle one Sunday evening, and found about thirty respectably dressed people, sitting round a large and handsomely furnished room, and looking very serious, not to say devotional. The medium, who was a lady, sat at a green table, and commenced the *séance* by asking each visitor to write the names of dead friends or relations on slips of

paper, which were then folded and thrown in a heap on the table. Taking up one of these, apparently at random, she asked of the air, "Is this spirit present?" and was answered either by silence or by three raps on the table. If by raps, the paper was opened, and the writer requested to put any questions he pleased to the spirit who was present. The devotees, with almost all of whom the medium seemed on intimate terms, had usually a whole string of inquiries written out and numbered which were propounded to the unseen presence as Question No. 1, No. 2, and so on; the answer consisting of three raps for "yes" and two for "no." Whether this system was arranged to secure privacy for the questioner, or an easy time for the medium, we could not determine, but it certainly did away with any need of intelligence on the part of the oracle. Ours was a "writing medium," whom the spirits, when exceptionally powerful, and sufficiently well educated, can "control to write" their replies, which are rapidly traced in inverted characters by a pencil held in the wonder-worker's fingers and operated by the spirit. The audience, seemingly aware that it is the practice of the unseen world to write backwards, accepted this *tour de force* as a convincing proof of supernatural agency, and asked, in simple good faith, for advice on personal or family matters with the evident intention of acting on the hints of their ghostly, and therefore presumably omniscient, relatives. It is hardly necessary

to say that when, towards the end of the *séance*, a spirit invoked by one of our party appeared, it proved extremely incoherent and incorrect in its statements; but it was a little remarkable to find the medium's accustomed circle anxious to help her out of her difficulties, and ready to lay the blame of the spirit's fatuity at the door of our want of faith. There are hundreds of these quacks driving a flourishing trade in San Francisco, and it is not many years since a wave of spiritualism rolled over the United States, puzzling Europe, as we were puzzled, to reconcile the easy credulity we witnessed with the proverbial 'cuteness of the American character.

The Chinese problem, whose consideration has been purposely deferred, presents itself to the traveller at every step of his progress throughout Western America. There is a large Mongolian population in all the western towns, where the whole of the humble, and much of the skilled labour is performed by men of the yellow race. They are largely employed as labourers on the Central Pacific Railroad; they are scattered broadcast throughout the Californian gulches, washing over again the gravels left by the whites; they raise fruit and vegetables with much success on the Pacific slope; and household work is a Chinese monopoly throughout California, where every dinner is cooked and every shirt washed by Chinamen. The Chinese question is one of great moment for the United States, and in view

of its importance I reserve for a separate chapter both a description of "Chinatown," the Mongolian quarter of San Francisco, and any discussion of the rights of the Chinese in America.

Once more, and for the last time, we turned our faces towards the Snowy Range upon whose western flanks we had yet to seek the famous "Big trees," and the Yosemite Valley. This was our last American trip, and, as the Pacific mail steamer would receive us immediately on our return to San Francisco, to start was like taking a farewell of the city, which it would be ungrateful to leave without a few kind words for its people. The lawless origin of Californian society has already been glanced at, but faithfully to paint the pandemonium which existed on the Pacific coast for ten years after the first advent of the gold-seekers would need a palette full of the darkest colours. "For a few years the solemn pines looked down on a mad carnival of godless licence, in whose picturesque delirium human character crumbled and vanished like dead leaves." * If the genius of Bret Harte has found some traits of humanity among the reckless populations which thronged the gulches of the foot-hills from 1849 to 1860, it is because, like the miners so skilfully depicted in his stories, he knows how to sift a few grains of pure gold from a mass of rubbish. But the inferno of '49 has gone, and scarcely a flicker of its old flames lights the mining camps of to-day,

* "Mountaineering in the Sierra Nevada," by Clarence King.

while California now contains a population which respects law and order as much as any other state in the Union. In estimating the people it is a mistake to link the past too closely with the present. The lawlessness, if not the crime, of the "early days" was the result of circumstances, but the establishment of order was the act of the people. Meanwhile, as Bret Harte touchingly shows, society, even at its worst, was never without some salt, and at least one virtue, that of generous hospitality, flourished throughout the foot-hills. In addition to this a certain gaiety and cheerfulness characterized the camps, as it now characterizes the whole state. The Californians are a gay, light-hearted people, among whom the long faces and sedate manners of New England are unknown, who love to "seize the day" and bask in the sunshine of life. Their delicious and stimulating climate, rather than their reckless ancestry, is the cause of this pleasant characteristic, which, for a stranger who himself drinks exhilaration with their air, makes the West much pleasanter than the East. It may be that there is little intellectual aspiration, and less desire for cultivation than for wealth; but the East also worships dollars, while it is less able than the West to enjoy what dollars bring.

Although civilization, properly so called, is not more than twenty years old on the Pacific slope, the West has already produced a number of original and imaginative writers of quite exceptional powers. There are also

artists in San Francisco, who are painting the peaks and forests of the Sierras with extraordinary vigour and feeling. In matters of business the Californians are distinguished by an energy and splendid audacity which is all their own, and if, socially, there is room for the criticisms of over-fastidious Bostonians and New Yorkers, the foreign visitor loses sight of such trifles, in view, not only of what these bold bright people are, but of what they promise to be.

CHAPTER XXIII.

THE CHINESE IN AMERICA—CHINATOWN.

THERE are a hundred and twenty thousand Chinamen in the United States, of whom about twenty thousand live in San Francisco, while the remainder are widely distributed throughout America, being thickest in California, where they form a conspicuous part of the population, and thinnest in the eastern states and cities. There is a manufactory in Massachusetts which is run entirely by Chinese labour, and the Chinese have almost a monopoly of the laundry business of New York, but the traveller does not see many Mongolians until the Rocky Mountains are passed, after which they appear in increasing numbers all the way to the Pacific. The Chinaman is usually only a humble worker, who thankfully eats of the crumbs which fall from the rich table of white labour; but in San Francisco there are Chinese merchants, manufacturers, and brokers, as well as washermen, artisans, and labourers.

The Mongolian quarter is called "Chinatown," and consists of half a dozen blocks of houses, abutting on the best part of the city, and exclusively occupied by

Chinese warehouses, manufactories, shops, and dwellings. Chinatown is a fragment of the Celestial Empire itself, planted in the midst of an American city. The influences which absorb Teutons and Celts alike into the national life of the New World leave the Chinaman absolutely untouched. Such as he is in the streets of Canton, he remains in Chinatown, while he transforms the wooden houses of America into excellent imitations of those he has left behind him. All this makes a ramble through the Chinese quarter of San Francisco a most interesting experience, and it may be undertaken alone and at night by any visitor who has the courage to disregard the absurdly alarming cautions which he is sure to receive as soon as he begins to make inquiries on the subject. The city police are in the habit of chaperoning strangers who desire to see the Chinese quarter, and have an interest in giving the worst possible impression of it. Fortified against a host of imaginary dangers by an escort which cost us five dollars, and prepared for seeing all sorts of horrors, we were led through the slums of Chinatown without experiencing a single thrill of disgust, or finding anything half so shocking as we should have done in similar quarters of London or New York.

The Chinese give a national character to their streets by adding balconies of carved wood to the houses, which they cut up into small sections, and by hanging up handsome vertical sign-boards, lacquered with vermilion,

and carrying the name of each merchant and shop-keeper in gilded Chinese characters. The provision shops display an extraordinary variety of strange eatables, including dried fish from Japan, sea-slugs, edible seaweed, split ducks, and duck cutlets, eggs preserved in black earthy envelopes, and tiny portions of strange green vegetables. Above the roofs of such shops hang strings of thin mottled sausages, drying by thousands on high wooden frames. Here is a fraction of a house, forming a tailor's shop, behind whose tiny window a grave Chinaman is at work upon blue and black calico garments. Below is a cellar occupied by a barber, who is busy with his narrow razors and tweezers taking every hair from the scalps, ears, and nostrils of his patient customers. Opposite, is a restaurant, decorated with quaintly carved wooden screens, and full of gay company, busy with bowls, chopsticks and tiny tea and samsu cups. Next door is a merchant's ware-house, piled with tea-chests or packages of rice, and in charge of two or three spotless and serious clerks who calculate with a little frame of sliding wood buttons, and make entries in stitched books of filmy yellow paper with a camel's-hair brush and Indian ink. Then comes a jeweller's shop with three feet of frontage, and within, the art craftsman, whose long, flexible fingers, each ending in an inch of nail, are cleverly twisting gold and silver wire into filigree, or who sells a pair of green jade ear-rings to the passing *belle Chinoise.*

Here is a joss-house, or temple, from whose open door comes the heavy scent of incense, and here a curiosity shop, crowded with carved ivory, china dragons, curious silks, and nameless nicknacks. Along the side walks steals a silent but considerable stream of sedate pig-tailed Mongolians, dressed in blue blouses and black calico pants, gathered in at the ankle upon white hose. They are for the most part workmen; but how quiet, intent, and methodic is the crowd! No white men are to be seen, and the visitor might easily suppose himself in Canton, so entirely national is the picture before him.

From such a street we dived in the first instance into a basement forming a pawnbroker's shop, where goods, we were told, are pledged for a song by that inveterate gambler the coolie, and sold, in case of non-redemption, at profits of a hundred per cent. The place was dark and dirty, but it was very orderly, and "my uncle" looked like a quiet man of business, and was probably no worse than some of his London brethren. Thence we were taken to an "opium-den," a small room with two tiers of bunks running around it, as in a ship's cabin. These were about six feet square, carpeted with clean India matting, and furnished with a couple of little foot-stools serving for pillows. In the centre of each stood a large tray carrying two opium-pipes, a small oil lamp, a little horn box, holding the drug, and a few wires like knitting-needles. The pipe-bowl is of earthenware

shaped like the rose of a watering-pot, but having only one central hole, and mounted on a bamboo stem. Two men reclining at length, with the tray between them, occupy each bunk, and the smoker commences operations by dipping one of the knitting-needles into the opium-box and taking up a small quantity of its viscid contents. He heats and reheats this over the flame of the lamp, rolling it cleverly between whiles on the convex surface of the pipe, until he has fashioned it into a tiny cylinder which is finally stuck concentrically on the hole in the bowl, and then lighted. Over this delicate process of preparation the smoker lingers lovingly, but two or three slow, voluminous puffs exhaust the opium, and the operation of modelling a new pellet recommences. After five or six such doses, sleep supervenes, and the man lies for an hour or so enjoying his dreams. Then he gets up and goes about his business, apparently none the worse for the indulgence, and certainly a much more respectable person than the dram-drinker. I am credibly informed that not more than ten per cent. of the Chinamen in San Francisco are habitual opium-smokers, but the majority drop into the "den" now and again for a smoke just as the whites take a drink. The name of "opium-den" seems to be singularly misapplied. There is absolutely nothing to shock the most sensitive person in a roomful of silent and recumbent figures quietly enjoying the Chinese equivalent for a "whiskey straight" without

the latter's common accompaniments of rowdyism and profanity.

From the opium-house we adjourned to a restaurant kept by a very business-like Chinaman, named Sam-Li, who spoke English well and was a man of considerable property. Sam-Li entertained us with cigars and tea and showed us over his establishment with some pride. In one large room a number of working men were supping together in celebration of some feast-day. The guests sat around a table where, while each convive had his own tiny cup of scalding tea and another of samsu, the company ate with chopsticks out of a common bowl, replenished at every course with mysterious delicacies. Here we were pledged in samsu and tea, the latter being delicious and the former like a sweet and fiery sherry. We were much struck with the air of enjoyment shown by these people, who seemed as happy as children in their social intercourse. In a smaller room was a select supper party of six, three of whom were girls, magnificently dressed, but looking like children, with hair elaborately banded and faces delicately painted bright rose and white. The women were probably high-class courtesans, but the utmost propriety reigned, and there was the same appearance of simple enjoyment as characterized the larger party of men. We left our smiling host Sam-Li to visit one of the lodging houses, where operatives and domestic servants sleep. A dwelling had been partitioned off into a number of

small rooms, in each of which were wall-shelves arranged like the steerage bunks in a ship. Here the men lay, closely packed indeed, but not more crowded than in an emigrant vessel, while, beyond a scanty supply of air, there was nothing to shock the most fastidious person. The Chinese do not care for much light, whether natural or artificial, in their dwellings. Although gas and petroleum are both cheap, they prefer, as still cheaper, their own lamps, little open vessels of oil, whose smoking wicks blacken the walls and ceilings of the houses, giving our anti-Chinese guide occasion to remark on the dirty habits of the people. In the matter of cleanliness, however, the Mongols are not nearly so black as they are painted. They wash themselves all over daily; the cooking is done in the open air outside of the crowded rooms, and they dispose of sewage matters in the practically cleanly, though offensive, national manner.

From the lodging-house we walked through a narrow street entirely given up to a low class of prostitutes. Here the subdivision of houses appeared to have reached its limit, the women inhabiting rooms which are little better than cells. Each door opening on the street is fitted with a wire grill through which the painted tenant stares at the passers-by. Even this quarter exhibited nothing worse than what may be seen in low districts of American and European cities, while the total absence of drunkenness and rowdyism, was distinctly in favour of the Mongolian. The number of Chinese

prostitutes in San Francisco, though grossly exaggerated by the anti-coolie party, does not exceed two hundred and fifty, a surprisingly small total among an adult male population of nearly twenty thousand.

Every street in Chinatown has its Buddhist joss-house, or temple, usually consisting of a room in a tenement house, containing half a dozen shrines, with the god of peace, wealth, or plenty in place of a Virgin or saint. Before each image burns a "joss-stick" of incense and a small swinging lamp. The attendants, as in the Christian churches of Italy, make a profession of begging, and, from the poor appearance of both priests and temples, it seems that there is not much religious enthusiasm in Chinatown.

We visited the theatre, of which there are two, and found a large building, decorated externally with great lamps and quaint Chinese devices, and crowded within by a shaven and pig-tailed audience, grave, quiet, and orderly. The back of the stage, whose proscenium was ornamented with strange paintings, was occupied by the "band," consisting of two agonizing Chinese fiddles, and several tom-toms or drums. "Music" accompanied the action almost continuously, and a great many intolerably tedious solos were sung, the play appearing to be some kind of musical farce, very monotonous and seemingly very stupid, for the audience neither laughed nor applauded. The *ars celare artem* is quite disregarded in the conduct of the Chinese

drama. Scene-shifting, such as it is, was accomplished before the audience, the stage carpenter making his exits and entrances when and where he pleased. Tea was brought to the musicians and actors in the same unceremonious way, and when the place grew too full, the crowd overflowed on to the stage, which seemed almost as much at the service of the public as of the actors. Our presence was hardly noticed, and, if I compare this concourse of Chinese coolies, drawn for the most part from the humblest, not to say lowest, ranks of society, with the audiences of the theatres in Leadville, candour compels the confession that the Mongolian audience shines by the contrast. The Chinese operative is no rowdy, and as he drinks nothing stronger than tea, his behaviour is excellent; perhaps similar classes among whites would be as orderly if their diet were as simple and drink as harmless as the Chinaman's.

Apart from the white working classes with whom the Chinese compete, and who hate them cordially, no unprejudiced person has a word to say against the yellow race. On the contrary, the universal testimony of American merchants, municipal officers, ministers of religion, and employers of labour declares that, while their mercantile men are exceptionably able and honourable, the masses are no less moral, while they are cleaner, more orderly and more industrious, class for class, than the whites. Crime is less frequent

in Chinatown, disease less fatal, and the death-rate lower than among the native population of San Francisco. The Chinese have built railways, reclaimed land, and established a number of manufacturing industries in California which would have been quite impossible in their absence, while the character of American home life has been raised, to the great satisfaction of San Franciscan housewives, by their universal employment as domestic servants. In a word, the Chinese operative in America is distinguished by the possession of the very qualities whose rarity among our own working classes we are always so pathetically deploring. He is abstemious in regard to food, an abstainer as to drink, industrious to the last degree, requiring no supervision when he knows his work, docile, clean, patient, quiet, and respectful. His honesty, so recklessly impugned, is negatively proved by the City police reports, and positively by the uniformly favourable testimony of those who employ Chinese servants in their houses and about their persons. The Chinese merchants and manufacturers of San Francisco bear the highest character among their American *confrères*. They are noted for fair dealing, prompt payments, correct accounts, truthful statements, and aversion to litigation. The word of a Chinese merchant is thought as good as his bond. Many of these men are wealthy, and their charity is evidenced by the fact that the number of poor Chinese seeking public alms is very small indeed.

This favourable picture of the Chinese in America is no fancy sketch. By the joint action of the two Houses of Congress a special committee was appointed in July, 1876 "to investigate the character, extent, and effect of Chinese immigration to America, with power to visit the Pacific coast for that purpose." This committee sat at San Francisco, and, as might be expected in a city the bulk of whose voting population is violently anti-Chinese in feeling, the evidence received was of the most contradictory character. Disregarding, however, the statements of politicians and aspirants for public offices, who trim their sails, no less in America than in other countries, to catch the wind of popular favour, unprejudiced minds will receive the independent evidence of judges, bankers, merchants, manufacturers, farmers, clergymen, physicians, missionaries, and consuls as indisputably favourable to the Chinese.

Such then are the immigrants whom, in defiance both of humanity and treaty obligations, a Californian mob assaults with impunity, and Californian law oppresses. The report of a select committee, appointed by the state of California to inquire into the Chinese question, states it as "a well-known fact, that there has been a wholesale system of wrong and outrage practised upon the Chinese population of this state which would disgrace the most barbarous nation upon earth." This was in 1862, but matters had not mended in 1876, when the following uncontradicted statement was made by Colonel Bee, an

American spokesman for the Chinese, before the Congressional Committee already referred to:—"Acts of brutal violence against the Chinese which are a disgrace to civilization, have transpired in the streets of San Francisco. No country and no government in the world has ever permitted indignities to be cast on any race such as those which are permitted by the government and municipality of San Francisco and the state of California."

In view of these admissions, it is needless to describe how the Chinese in America have been murdered, assaulted, and maltreated with impunity; the facts are not disputed, and they cannot be stigmatized in stronger terms than those which have already been quoted from official sources. But the acts of rowdies and mobs have been almost paralleled by those of the state and municipal authorities of California, who at various times have harried the Chinese with oppressive ordinances some of which have since been set aside by the superior courts as in contravention of treaty obligations, and unconstitutional. Such were the capitation, and foreign miner's taxes, the tax on the export of embalmed bodies, the tax on the hand-baskets in which Chinamen carry home washing, and the air and queue ordinances. Of the two last-named acts, the former made it illegal for any one to sleep in a room containing less than five hundred cubic feet of air per man, and the latter ordained that the hair of every

person arrested for any offence should be cut within two inches of his scalp. Under the first of these shameful ordinances, which, though ostensibly of general application, only touched the Chinaman, the gaols were suddenly crowded to overflowing with unoffending men whose only security against a loss which they considered a bitter and lasting degradation, was the payment of a heavy fine.

The persecution of the Chiense in California is ostensibly directed against paganism, filth, a lower civilization, the depletion of American wealth, and the danger of Mongolian supremacy. Three-fifths of these charges concern matters of fact, and have already been sufficiently answered by American evidence, but the remaining two, which are purely suppositious, have been so dressed up with fancy and exaggeration that many people in America believe they are serious national dangers instead of mere bogies. In an address to the people of the United States, issued by a committee of the Californian legislation, it has been stated that the Chinese labourers of California have abstracted the equivalent of a hundred and eighty million dollars from the money wealth of the state, while they have contributed *nothing* to the national wealth. This statement was bandied about the halls of Congress, and the eastern cities, and, coming from an official source, was widely believed, although its absurdity can easily be demonstrated. It is the custom of the Chinese to send

a large part of their savings home, but, as the whole number of Chinamen in California has never exceeded ninety thousand, to credit them with having abstracted the sum in question from the state, is to allow at least two thousand dollars for the remittance of each individual. But it is not long since the Chinese became numerous on the Pacific coast, and, if each labourer saved so large a sum as two thousand dollars from his wages in a few years, it must be confessed that these people far surpass other nations in economy and thrift, qualities which are highly esteemed in a population. The grand total of precious metals sent to China since the gold discoveries to the present time does not exceed seventy millions of dollars, and it is ridiculous to assert that ninety thousand Chinese operatives have remitted a hundred and ten millions more than was required during this time to balance the entire Chinese trade with the Pacific coast. With regard to the statement that the Chinese have contributed *nothing* to the state or national wealth, it has been already stated that railroads have been made, land reclaimed, and industries established which would have been impossible without their abundant and cheap assistance. Americans themselves admit this, and the Congressional Committee's report avers that "the resources of California and the Pacific coast have been more rapidly developed with the cheap and docile labour of the Chinese than they would have been without, and so far as material prosperity is concerned, it cannot be

doubted that the Pacific coast has been a great gainer." The Chinaman earns a dollar a day, the white operative from two to three dollars a day, and as there are, at the present moment, about seventy-five thousand Chinese in California, the state clearly gains a sum of at least a hundred thousand dollars per diem from the presence of the yellow race. Is this nothing added to the state or national wealth? But, granted that the Chinaman sends his surplus earnings home, they are his own property, which he may dispose of lawfully as he will. If the Chinese are depleting America, how much more are the Irish, who, during the last fifty years, have sent home millions upon millions of dollars? It has been estimated that twenty millions of dollars have been spent in Europe by rich American tourists during the last ten years, but no one accuses these gentlemen of depleting the country of wealth.

The last bugbear, that of Mongolianization, is finely portrayed in a message of Governor Irwin, delivered on the 6th of December, 1877. "It is unnecessary," says his excellency, "that I should make an argument to demonstrate the evils of Chinese immigration. In this state, and everywhere on this coast, they are universally conceded; nor are these evils of any ordinary character. The presence of the Chinese in this state in large numbers, with steady additions thereto from the exhaustless hive of China, not only threatens an irrepressible conflict between the American and Chinese civiliza-

tions, but has already initiated such a contest. If the right of unlimited immigration, conceded under the Burlinghame Treaty, is continued ; if Chinese immigrants are guaranteed the same rights that immigrants from the most favoured nations are, as is the case under this treaty, what is to prevent the triumph of their civilization in its conflict with ours ? I go further and say that this triumph is as certain as any event can be which is yet in the future if the Chinese are to enjoy perfect and absolute protection here." These are strange words from a high official of a country dedicated to the proposition that all men, irrespective of race or colour, are born free and equal. Admitting, however, that national policy must be governed by expediency rather than by theory, let us endeavour to see how far the fear of being swamped by the Mongolian is a reality or a sham. If you should ask any merchant or manufacturer in San Francisco, not a politician or an office-seeker, whether he is afraid of Mongolian supremacy, he would laugh in your face. He regards the Chinese simply as labour-saving machines, and he would as soon expect to be dominated by steam-engines or reaping-machines as by this race. Like the Jew, who requires a country already settled for the practice of his useful national callings, and who would perish to-day, as of old, in a wilderness without supernatural aid; so the Chinaman may subserve white schemes of development but cannot initiate them. Hence the Chinese flow, whether

towards America, Australia, or the Straits, not as a dominant race, but as the servants of the dominant race. Chinese immigration to America, again, has hitherto been confined to the single province of Canton, and every emigrant has sailed from the British port of Hongkong. Their numbers have been grossly exaggerated, but it is a well-known fact, easily verifiable by the customs returns of arrivals and departures at the port of San Francisco, that the Chinese have been coming forward for some years in smaller numbers than they leave. The immigrants, who are almost exclusively adult males, do not indeed come to the States intending to remain. They have for the most part left behind them either parents, wives, children, or friends whom they look forward to rejoining after having put by a little money, while, so well informed and sensitive is the Chinese labour market, that whenever trade is bad in America the returning stream outnumbers the inflowing one.

The Chinaman's real offence is that he works for a dollar a day, and he can afford to undersell his white competitors because he is more abstemious and economical than they. Impelled by the fear that his accustomed luxuries are threatened, the American labourer thinks—

> "We are ruined by Chinese cheap labour,
> And he goes for that heathen Chinee"

with arms which are a disgrace to Christianity and civilization. Meanwhile the politicians mount the stump, and fan a convenient flame, with the result that Chinese

treaty rights have been totally disregarded and justice has leagued itself with popular violence to oppress an industrious and unoffending race.

By the treaty of 1844, confirmed by the Burlinghame Treaty of 1867, America and China mutually guaranteed complete protection of life and property, entire freedom of religion, education, and sepulture to subjects of either power resident in the other's country. This treaty, like our own with China, was not sought by, but was forced upon the Chinese, for Asia desires seclusion from the Western nations while these desire commerce with Asia. When Mr. Burlinghame returned from San Francisco to Pekin in 1866, he reported to the Chinese that a million of labourers could find employment on the Pacific coast. The Pacific Railway was not then completed, and capitalists engaged in that and other public and private works were eager to obtain labour from China at a cheap rate. Everything in fact was done on the part of America to encourage and regulate the immigration of the Chinese, while the latter, who have been immigrating for centuries to the Straits and elsewhere, were willing to come, the more so as they were protected by solemn treaty engagements. The Chinese were treated well in California as long as American citizens could make money out of their cheap labour, and when the hopes of getting a large portion of the China trade were encouraging, but they have since been abandoned to the mercy of the mob.

Still sheltering myself behind the highest American authorities, I close this too lengthy discussion by quoting from an address on "Our Relations with the Chinese Empire" by the well-known Dr. Wells Williams, late Secretary of the American Legation at Pekin. "One cannot but feel indignant and mortified at the contrast between the way in which the Chinese have treated us in their country, into which we have forced ourselves, and the way in which we have treated them in this country, into which we have invited them. We have used them as if they had no rights which we were bound to respect, and refused that protection as men and labourers which the existing treaties guaranteed them. Is it necessary in order that we should carry out our own treaty obligations that we wait for a Chinese minister at Washington to officially inform the Secretary of State how they have been violated; or for a Chinese consul at San Francisco to complain to its mayor that his countrymen are stoned, robbed, and set upon, and no one punished, no one arrested for such deeds? Is our Christian civilization not strong enough to do right by them?"

CHAPTER XXIV.

THE "BIG TREES"—YOSEMITE VALLEY.

September 2–13.

IN the spring of 1852, a man named Dowd was engaged in supplying meat to a party of canal excavators who were bringing water to the gold-diggers of Murphy's camp, a productive but dry gulch in the foot-hills of Calaveras County, California. Dowd's hunting camp being pitched one night about sixteen miles above Murphy's, and near the Stanislaus river, his attention was arrested by the immense size of some of the forest trees, which towered for a hundred feet or more above even the gigantic yellow and sugar pines to which he was accustomed. He carried such a wonderful account of these vegetable monsters down to Murphy's, that the miners laughed at him, but on his story being verified, it soon spread through the newspapers, and was reported, for the first time in Europe, by the London *Athenæum* in 1853. Through some unaccountable remissness on the part of American botanists, Dr. Lindley was the first to

specimens had been imported to England by Messrs. Veitch, and he named it *Wellingtonea gigantea.* A subsequent examination by M. Decaisne showed that the tree was not generically new, as Lindley supposed, but a species of redwood, a genus already known to botanists under the name of sequoia. Properly speaking therefore the Californian big tree is called *Sequoia gigantea*, although in England the name of *Wellingtonea gigantea* still clings to the numerous specimens which have been planted in the British Islands.

The sequoias never form groups by themselves, but are always scattered among a much larger number of other trees. They are strictly confined to the great pine belt which clothes the western flanks of the Sierra Nevada, and occur only between the thirty-sixth and thirty-eighth parallels of latitude, never descending below five thousand, or rising above seven thousand feet of elevation. Only eight groups of the big trees have yet been discovered, all in the state of California, and, of these, the groves of Calaveras and Mariposa counties are the most important and best known. The former, which is most northerly in situation and contains the largest trees, was chosen for our visit because it can be taken *en route* to the Yosemite Valley.

Leaving San Francisco then, a party of three—for the cosmopolite, newly arrived from the Yellowstone Park, had now joined the socialist and cynic—we took train to Stockton, a town in the San Joaquin Valley, not far

south of the capital. Here we lay the first night, closely besieged by a combined force of mosquitoes and small water-beetles, the latter being so numerous that playing billiards was impossible without crushing them by hundreds on the cloth. Next day the railroad carried us to Milton, on the very edge of the cultivated plain of Central California, where we took stage for the big trees, distant about fifty miles. This ride occupied the whole day, the road, after leaving the San Joaquin Valley, ascending, in the first place gently, through the foot-hills of the range, whose low volcanic ridges "wander out into the plain like coast promontories enclosing bays of yellow prairie." Hills and plain are both oak-covered, the trees standing in clumps, as if arranged by a land-scape gardener, and giving a park-like aspect to the scene. The road, like the soil, is carpeted with a thick layer of fine red or yellow dust, which rose in clouds from under our wheels and flowed steadily with the wind towards the range, so completely enveloping the stage that it was sometimes impossible to see the leaders. On the way we met three large flocks of sheep which, as they passed, were quite invisible from the top of the coach, but their dust was seen, like a column of smoke in the air, more than a mile away.

When we had risen about a thousand feet, pines began to mingle with the oaks, the first species to appear being the digger, or nut pine (*Pinus sabiniana*),

Indians. Its foliage is pale and parched looking, evidencing the arid climate, and the tree, like the oaks which keep it company, seems to exist with difficulty in so dry a region. At two thousand feet elevation the oaks and nut pines alike disappear, and the scattered vegetation gives place to true forest. This in the first instance is chiefly composed of yellow pines (*P. ponderosa*), magnificent trees five or six feet in diameter and two hundred feet high. These are soon joined by the sugar pine (*P. Lambertiana*), which, appearing first at three thousand feet of elevation, becomes perfectly developed at five thousand feet, and dies out at seven thousand feet, while the hardier yellow pine endures up to timber-line. The sequoias apart, it is impossible to imagine a more beautiful conifer than the sugar pine. Its smooth, brown shafts, six or eight feet in diameter, rise with a gentle taper to a height of two hundred and twenty feet, while from its far-reaching and graceful branches hang great cones fifteen inches in length. Masses of exuded resin, sweet to taste and golden in colour, cling to its trunk, and through its resonant needles the wind sings a grand woodland air. A little higher we come upon the Douglas spruce (*Abies Douglasii*), which thrives throughout the main pine zone, attaining a diameter of six or seven feet and a height of two hundred feet. The white pine, the silver fir, and the arbor vitæ now help to swell the forest which, at this elevation, displays a vigour, symmetry, and distribution that is absolutely

perfect. The trees are neither crowded nor in too open order, but each has room to display its stately beauty without ceasing to be a member of a group. There is no undergrowth, as in tropical jungles, but the enchanted traveller may wander at will through the half-shaded, half-sunlit aisles of this glorious natural colonnade, satisfying three senses at one and the same time with beauty, odour, and music.

Such is the character of the great pine belt, more than four hundred miles long and forty miles wide, which stretches from end to end of the Sierra Nevada; its lower margin formed of scattered and thirsty oaks and pines, its centre a zone of profuse luxuriant life, and its upper edge a ragged rank of hardy trees struggling for a foothold with the snows of the summit peaks. Lengthwise, as transversely, the forest is distinguished by zones which fade into one another by imperceptible gradations, though possessing well-marked characteristics at either end. Towards the south, it is more open, and single trees reach their greatest perfection. Northward, it grows gradually denser, until on the shores of British Columbia the pines are crowded as closely as canes in a jungle, and become wandlike in growth. It is in the centre of the belt, both along and across it, that the forest is finest, and here, as if nurtured by a combination of conditions most favourable to vegetable life, the big trees are found.

Only on good soil amply supplied with moisture is

such a natural phenomenon as the pine belt in question possible, and it is not, at first sight, clear how these conditions have come together in arid Western America, and upon the stark granite flanks of the Sierran uplift. But the prevailing westerly wind, which blows continuously from the Pacific, is deflected upwards by the hills of the Coast range, whose feet, as already mentioned, stand in the ocean; and the moisture-laden current of air, passing over Central California and the foot-hills, strikes the Sierra Nevada at a point about four thousand feet above sea-level, and distils in rain and snow upon its flanks and summit. With regard to the soil, a close examination of the forest discloses the fact that its pines are everywhere rooted in morainic *débris*. As the glaciers which, in a colder age, poured out of every Sierran glen, crept slowly backwards before the advent of a warmer climate, their terminal moraines were left by the retreating ice at successively higher and higher levels upon the flanks of the range. This process took place so slowly that the glacial detritus became pretty evenly spread over the hill-sides, ending however at the base of the summit peaks; often at the feet of abrupt, bare rocks, which still retain the grooves and polish left by the passage of ice. Wherever this old moraine extends the forest follows, where it terminates the pines end also, and where, within the moisture belt, its drift soils are richest and deepest the trees are finest.

Darkness fell before we reached the hotel in the Calaveras Grove, and never shall I forget the impressions received during the last few miles of this drive. The night, as usual, was still and starlit; the road, carpeted with odorous pine needles, and shrouded with gloom, seemed to open as we advanced, leading one knew not where, through avenues of dark columns whose unseen capitals were hidden in star-spangled obscurity. Balsamic aromas filled the air, which stirred at intervals in soft pulsations, half scent, half music, along the mysterious aisles. Suddenly the enchanted forest opened to a clearing, and we pulled up before a wooden hotel, sentinelled by two magnificent sequoias, where, though buried in the heart of the pine belt, we were registered and lodged as promptly and prosaically as if we had been in New York or Philadelphia.

The valley, or rather depression, in which the Calaveras Grove of big trees is situated, contains nearly a hundred sequoias, not including those of from one to ten years' growth. They occupy a space about a thousand yards long, and two hundred and fifty yards wide, and are accompanied by hundreds of sugar and pitch pines of astonishing proportions, which, anywhere else, would be regarded as vegetable monsters, but are here completely dwarfed by the big trees. The grove is nearly five thousand feet above the sea, and occupies in this respect a point where the Sierran Forest finds its highest development. In 1853, shortly after Dowd's discovery,

one of the largest trees was cut down. Five men worked twenty-five days in felling it, boring the trunk through with closely apposed auger-holes and toppling the tree over with wedges. The stump was then smoothly levelled, six feet from the ground, and a pavilion built over it. This room is twenty-seven feet across and has accommodated thirty-two dancers. Theatrical performances have been given in it, and, in 1858, a newspaper called the *Big Tree Bulletin* was printed within its walls. The diameter of the trunk itself is twenty-four feet, but the bark, which has been removed, was eighteen inches thick. The age of the tree, as determined by the annual rings of growth, is more than thirteen hundred years. A step-ladder of twenty rounds leads to the summit of the fallen log, whose dimensions, as compared with ordinary timber, begin to be appreciated while mounting this staircase. On top is a bowling alley, or rather two alleys side by side, stretching along the levelled upper surface for eighty feet, while from the point where these terminate it is a walk of nearly a hundred yards to the end of the stem. The largest trees in the grove are named after American and other celebrities. Four of them, viz. "Keystone State," "General Jackson," "Mother of the Forest," and "Daniel Webster," are more than three hundred feet high, Keystone State being three hundred and twenty-five feet, and the tallest, though not the stoutest, of the group. The biggest tree now standing is Mother of the Forest, three hundred and fifteen feet high and sixty-one

feet round at six feet above the ground, measured without the bark, which was stripped for exhibition several years ago and perished in the fire at the Crystal Palace. The Keystone State is the tallest tree yet measured on the American continent; there are stories of trees having once stood in this grove over four hundred feet in height, but when we observe, as Professor Whitney has pointed out, how regularly and gradually the trees diminish in size, it becomes evident that no sequoia has ever overtopped all the others by seventy-five feet and more. The average elevation of the mature trees in the Calaveras Grove is two hundred and seventy feet and their average girth, measured six feet above ground, is forty-one and a half feet. The sequoia is beaten in age by some English yews; in height by the Australian eucalyptus which, though slenderer, overtops it by a hundred and fifty feet; and in diameter by the baobab, whose height however is insignificant; but no tree except the blue gum, height and thickness both considered, approaches the sequoia in magnificence.

The foliage of the big tree is very thin for its vast size and looks totally inadequate to the nourishment of its enormous product. The cones also are insignificant, and it is upon the trunk of the sequoia that Nature seems to have spent all her art. The shafts of these trees are simply perfect for symmetry, texture, and colour. Where twins or, as in some cases, triplets occur, the tapering parallel shafts are grouped with indescrib-

able grace. The wood is light and dry, strong and straight grained, coloured like cedar, and slightly scented, while the bark is very thick and of a soft spongy structure. There are many fallen trees in the grove, one of which, "The Fallen Monarch," has been down for centuries. It is still eighteen feet in diameter, though not only the bark but much of the wood of the trunk has decayed. What is left is perfectly sound, but the upper half of the tree, shivered into fragments by the fall, has mouldered away, and sequoias nearly a hundred years old are growing where the top fell. "The Father of the Forest" is another fallen tree whose trunk has been hollowed by fire into a great tube, or tunnel, through which one can walk for two hundred feet, finally emerging at a knot-hole, big enough to admit the stoutest man. Some trees, which are still flourishing above, have been completely gutted by fire below, and in one of these, "The Miner's Cabin," we spent Sunday morning writing and reading, our party of three having ample room for chairs, tables, and accessories.

Fully to appreciate the magnificence of the Sierran Forest, one should live, as we did, for a few days among the trees themselves. To watch the light of sunrise adding a rosy tint to the chocolate columns of the scattered sequoias, a purple to the close-knit brown shafts of the sugar pine, and a flaring red to the great flakes of the pitch pine bark; or to lie, in the starlight, on the scented needles, letting one's eyes climb little by little

up the long tapering masts into the very vault of heaven ; —that is the way to realize the grandeur and beauty of the big trees.

We left the Calaveras Grove with much regret, and taking the stage, drove again for a whole day down through the forest belt to Murphy's, the mining camp already mentioned, where we slept a night before starting for the Yosemite Valley. The aspect of the country around Murphy's, where many square miles of the surface have been washed for gold, is very curious. All the soil has been stripped from the bed rock, which consists of curiously weathered limestone, honeycombed into fantastic crypts and arches by the action of water. The earth's very ribs seem to be bared, and a ghastly skeleton of stone lies bleaching under the glaring Californian sun where once was a park-like country, sprinkled with live oak and nut pine. Nature does her best to repair damages, and has already thrown a thin green covering over the naked rock here and there, but such growth is slow in this arid climate, and it will be long before these mining scars are hidden.

Next morning, the stage started at six o'clock, and, keeping to the foot-hills, crept southward along the range all day, passing through country almost the whole of which has been washed for gold. Hardly any mining is now in progress, for the gulches were practically exhausted within half a dozen years after the first discovery of gold, and the precious metals, as we have

seen, are now obtained almost entirely from the lodes, or "fissure veins," of Nevada and Colorado. Here and there, however, a group of patient Chinamen is seen, working old gravels over again; or banks of detritus, too poor to pay for hand-washing, are being attacked by powerful jets of water, issuing from nozzles like those of a fire-engine. Hydraulic mining, as it is called, is the most effective means ever employed for washing auriferous gravels. It requires an ample supply, and a great head of water, together with a disposition of the ground favourable to the escape of vast masses of rubbish. Where these conditions are combined, the melting snows of the Sierra are caught and tanked high up in the mountains, and great pipes, strong as steam boilers, bring the water down into the valley. The nozzles employed are sometimes as much as six inches in diameter, and from them issue streams having the solidity of an iron bar, and the strength of gunpowder. Before their attack high cliffs of *débris* give way like sand, and great boulders are tossed about in the stream like leaves in the wind. The gold is saved, as in ordinary gulch mining, by allowing the turbid water to escape through sluices furnished with riffles, charged with mercury for amalgamation.

But not even hydraulic mining, which, in the hands of the "forty-niners," would have cleared the gold from the foot-hill valleys in six months instead of six years, can revive camps now dead or dying. The stage passes through towns of weed-grown streets and empty

houses, whose doors swing wide, whose windows are broken and unshuttered, and within whose desolate rooms furniture too bulky for easy removal still stands. Here is the post office with dusty racks holding a few unclaimed letters, and there the saloon with its billiard tables still in place, but abandoned as if a sudden panic had driven away the people. Such a scene of desolation is often accented by a Chinese occupation of some outlying street, whose houses have been divided into dark and smoky boxes, where yellow men and women pack close, while poverty, pigs, and foul smells haunt the filthy roadway. So the day passes, driving through a stripped and corpse-like country, or towns from which enterprise has drifted away to more prosperous mining centres, and where the helpless few who remain look like fishes stranded by an ebb tide. Things have changed vastly in the Californian foot-hills since the "fifties," and the sights and sounds of to-day are strangely contrasted with those of the "roaring camps" in the "early days."

After fourteen hours' staging we arrived at "Priest's," where we passed the night, and, starting next morning at four o'clock, turned our faces from the foot-hills towards the range, reaching the lower edge of the pine belt in about three miles. Thence to the Yosemite Valley the road leads through forest, now a succession of open plantations, and again a thick grove of magnificent pines. At an elevation of about six thousand

feet, a group of sequoias occurs which, though less important than that of Calaveras, comprises some splendid trees. One of these, named "The Dead Giant," is actually traversed by the track, the stage passing right through the trunk, a third of whose bulk remains untouched on either side of the way to form the walls of this strange tunnel. Through this fitting gateway we finally passed away from the big trees, and continued roughly bumping upwards, over rocks of grey granite, till we reached the divide between the Tuolumne and Merced rivers, from which point, nearly seven thousand feet above sea-level, the road descends for the rest of the way, giving occasional glimpses of the Yosemite precipices, grouped by distance into a single beautiful and astonishing picture.

The Yosemite Valley is a great trough, hollowed in the western flank of the Sierra Nevada nearly at right angles to the trend of the range. Its floor is a level area, six miles long, and varying from half a mile to a mile in width, sunk almost a mile perpendicularly below the general level of the region in which it occurs, and its sides are vertical or almost vertical walls of white granite. This trough, in the words of Professor Whitney, "is quite irregular, having several square and angular recesses let back as it were into its sides, and at its upper end it divides into three branches through either of which we may, going up a series of gigantic steps as it were, ascend to the general level of the Sierra. . . .

Down each of these branches, or cañons, descend streams, forks of the Merced coming down the steps in a series of stupendous waterfalls; while at its lower end the valley contracts into a narrow gorge," through which the river foams on its way to the San Joaquin.

The stage approaches this extraordinary depression from above, and, descending the face of its northern wall by a dizzy winding road, finally turns the traveller out at the doors of one of three hotels built on the floor of the trough. Here the stupendous character of the cliffs which hem in the valley is first realized, the eye vainly trying to estimate their height, which, relatively to the width of the depression, is enormous. These walls, for such they are, look smooth and white, no vegetation clings to their sheer surfaces, and the pines which cap them might be blades of grass, so dwarfed are they by distance. The floor of the valley is covered with magnificent pitch pines and cedars, springing from an undergrowth of manzanita and wild raspberries; the river-banks are thickly set with alders, spruce, and fragrant white azalea; and the steeply sloping banks of rock piled against the feet of the cliffs are clothed with live oak, maple, and Californian laurel.

Cascades, without rivals in the world, pour over these wonderful walls, swelling into mad torrents when the sun begins to melt the winter snows, but shrinking almost to nothing after the summer's heats are over. Of the five chief falls in the valley the lowest is four hundred feet

and the highest two thousand six hundred feet high, the last, or "Yosemite Fall," surpassing in vertical height any cascade in the world, and possessing accessories of grandeur and beauty which neither pen nor pencil can adequately describe. The "Bridal Veil" is another fall, perhaps even more beautiful in general effect than the "Yosemite," but having a drop of only nine hundred feet; while the "Vernal" and "Nevada" waterfalls are two of the plunges, one four hundred, the other six hundred feet deep, made by the Merced river on its way down the "gigantic steps" leading up from the valley to the Sierra, and are probably, all things considered, the grandest cataracts in the world.

All the famous points of which one hears under the names of "El Capitan," the "Half-Dome," "Cathedral Spires," "Cloud's Rest," and others, are simply the most striking or loftiest features of the Yosemite walls. El Capitan is a single block of granite which projects from the cliff into the valley, like a squarely cut stone with a sharp and almost vertical edge, three thousand three hundred feet in elevation. It is quite impossible to realize the enormous dimensions of this rock, which can be seen in clear weather from the San Joaquin plains, a distance of fifty miles. The Half-Dome is even more astonishing than El Capitan. It is a crest of granite nearly five thousand feet high, shaped on one side like a helmet, but cut down sheer on the other for nearly half its height, and falling off thence in a very

steep slope to the bottom of the valley. This slope, which looks exactly like a talus of fallen rubbish, is really solid rock, and the mass appears to have been originally a dome-shaped elevation, one-half of which has been split off and disappeared. These are but two among a hundred other salient features of precipices, which are everywhere stupendous, and often sublime, in the combination of their spires, domes, and buttresses, with forest, and waterfall. From a particular spot, called Inspiration Point, all the striking features of the valley are seen at one time, and perhaps there is nowhere in the world a more astonishing view, yet, in spite of the extraordinary character of each element in the picture, something is felt to be wanting. Rocks, pines, and waterfalls have done their best, but the walls of white granite are grim; the summits are cold in colour, and the ridges which sweep upwards from one to the other are bare and forbidding. The forest itself is dressed in greens so pale that they look grey in the distance, and the mind, recovering from its first thrill of wonder, yearns for the subtler charm of the Alps.

The parapets of the Yosemite walls are accessible from below at several points, and the whole valley can be circumambulated above. We climbed the northern rampart at Glacier Point, three thousand five hundred feet above the Merced river, and, arrived at the top, lay with our heads over the sheer cliff, looking down upon pines which, though nearly two hundred feet high, appeared

like the trees of a Noah's ark; horses which were moving specks; and the hotel which seemed a toy house. If, from such a point on the summit of Yosemite walls, the eye turns from the dizzy brink towards the Sierra, it travels over a region of rolling ridges, and great granite domes, the hollows between which contain shallow layers of soil, nourishing scanty forests of pine; above and beyond which long bare ridges stretch upwards to the snowy peaks of the range.

The dome-shaped mountains which specially distinguish the Sierra Nevada, form one of the most curious and notable features of the region around Yosemite. The granite composing them is arranged in concentric layers, like the coats of an onion, and the domes, while accurately circular or elliptical in plan, have semicircular, or nearly semicircular profiles, so steep as to be perfectly inaccessible to an unaided climber. Such a cupola is the North Dome, a rounded mass of rock, rising three thousand five hundred feet above the valley, made up of huge concentric plates of granite; and such is, or rather was, the Half-Dome already mentioned, once a dome-shaped mountain, towering five thousand feet above the Merced river, but now a helmet-shaped crest, whose western half has been split off and removed.

This extraordinary mass, which is unique in the Sierra Nevada, and probably in the world, cannot fail to suggest the question, asked almost as peremptorily by the Yosemite walls everywhere—How has this

trough-like valley been formed? The cañons which seam the flanks of the range at every few miles of its length, have nothing in common with the Yosemite. These are all more or less V-shaped in section, and their sides never present such angular forms, such squarely cut re-entering angles, as those of the valley itself; while the Half-Dome is a perfectly inconceivable product of erosion by running water. It is equally impossible to suppose that the work was done by ice, for the passage of glaciers results in rounded surfaces and smoothly flowing outlines, of which there are none here. Professor Whitney has offered a singular explanation of this interesting problem which, strange as it sounds, is probably the true one. Dismissing erosion, whether by water or ice, as out of the question, and, having conclusively shown that the valley is no mere crack in the rocks of the range, he says, "In short, we are led irresistibly to the adoption of a theory of the origin of the Yosemite in a way which has hardly yet been recognized as one of those in which valleys may be formed; probably for the reason that there are so few cases in which such an event can be absolutely proved to have occurred. We conceive that, during the process of upheaval of the Sierra, or possibly at some time after that had taken place, there was at the Yosemite a subsidence of a limited area, marked by lines of fault, or fissures, crossing each other somewhat nearly at right angles. In other and more simple words, the bottom of

the valley sank down to an unknown depth, owing to its support being withdrawn from underneath, during some of those convulsive movements which must have attended the upheaval of so extended and elevated a chain, no matter how slow we may imagine the process to have been. By the adoption of this theory we are able to get over one difficulty which appears insurmountable with any other. This is the very small amount of *débris* at the base of the cliffs, and even, at a few points, its entire absence. There is no way of disposing of the vast mass of detritus which must have fallen from the walls of the Yosemite since the formation of the valley except by assuming that it has gone down to fill the abyss which was opened by the subsidence which our theory supposes to have taken place. What the depth of the chasm may have been we have no data for computing, but that it must have been very great is proved by the fact that it has been able to receive the accumulations of so long a period of time. The cavity was undoubtedly occupied by water, forming a lake of unsurpassed beauty and grandeur, until quite a recent geological epoch. The gradual desiccation of the whole country, the disappearance of the glaciers, and the filling up of the abyss to nearly a level with the present outlet, where the valley passes into a cañon of the usual form, have converted the lake into a valley, with a river meandering through it."

The most elevated region of the Sierra Nevada, called

the High Sierra, where the passes exceed twelve thousand feet, and the peaks rise to nearly fifteen thousand feet, occurs about a hundred miles south of the Yosemite, but the mountains which border the valley are hardly less imposing than those of the culminating portion of the range, and these Californian Alps offer every inducement to mountaineers for a visit. There are peaks, many of them still unscaled and unnamed, as difficult to conquer as any in Europe, and there is a type of scenery totally different to that of Switzerland to be seen. On the other hand, the summer climate of California is perfect for mountaineering expeditions, the sky is always serene, the sudden storms and vexatious delays so common in the Alps are unknown, and camping at elevations of eight thousand to ten thousand feet is easy and agreeable. The most striking contrast between Swiss and Californian mountain scenery consists in the absence from the Sierra of glaciers, and snow in large quantities. The Sierran flanks are also wanting in the grassy slopes which occur in Switzerland between timber-line and the snow; those high pastures, with their scattered châlets, where the Swiss cattle feed through the summer months. In place of these, the forest in California stretches right up to the snow, the hardiest pines only dying out at elevations of more than twelve thousand feet. The slopes of the Alps have no timber which can compare with the forest belt of the Snowy

Range, but the Swiss pine, with its brighter colour, gives more animation to a mountain-side than the grey needles of the great Californian conifers, so sombre in tone, and monotonous in their general effect. The lower valleys of the Sierra too, though often beautiful with grassy meadows, are not numerous or important enough to form a conspicuous feature in scenery of so grand a type as that of these Western Alps, while in Switzerland, on the contrary, these green, flower-spangled meads, have a never-failing charm for the mountaineer.

The High Sierra, in short, is sublime, but without the charm of the Swiss Alps. It has aspects of beauty, due to its clear skies and transparent air, such as no mountains in Europe exhibit; but it awes more than it attracts. Except for its belt of splendid pines, it might seem as if the Sierra Nevada, like the deserts around its feet, had perished of thirst, and that a grisly skeleton, rather than the living body of a great chain of mountains, lay prone along the Pacific shore. The range indeed is a sublime sarcophagus of cold grey granite, capped with silver, banded with a single wreath of luxuriant foliage, and steeped in opalescent sunlight; the grave of a mountain beauty, which departed with the beneficent vapours that once wrapped it in a living vesture of leaves and flowers, and for whose return the thirsty deserts and stark hills alike wait, dead and still.

We left the valley by the Madera stage which, after

traversing the pine belt, descends, instead of skirting, the foot-hills, and then crosses the San Joaquin plains to Madera, a station on the Southern Pacific Railway, a hundred and eighty miles south of San Francisco. Although this journey involves a hundred miles of staging, seventy of which are accomplished in one never-to-be-forgotten day, the Madera route to the Yosemite is much to be preferred to any other, and will supersede them all long before the commission agents who sell tickets for the valley have learned to speak the truth about the roads which they respectively recommend. The drive, whether through forest, foot-hills, or plain, was one long delight to us, now case-hardened against mountain roads and springless coaches. Our driver was a handsome and powerfully built man of colour, whose handling of a six-horse team over difficult ground was almost worth a trip to the Sierra to witness. Stage-driving in America is unmistakably high art, and, exercised as it is in mining and mountainous regions, where the stage is pioneer for the railroad, requires great courage, skill, and readiness. Before the completion of the Pacific Railroad the mining population of Nevada was supplied with all the necessaries of life from the Pacific coast, and the range was daily crossed, chiefly by way of the Sonora and Carson passes, by immense trains of waggons, which were linked together in threes and fours, and drawn by ten or a

dozen horses. The driver rode one of the wheelers and managed the whole team by his voice and a single line, the latter being used to signal one of the leaders, by an understood series of jerks, either to turn to the right hand, the left hand, or to stop, all the other horses being trained to follow his movements. Deserted shanties, now falling to ruin in isolated spots among the mountains, mark the old resting-places of this service, where passed masters of the twin arts of teaming and swearing drank many a "whiskey straight" in the good old "early days."

We landed, after a long and terribly dusty drive, at Madera, a little town on the very frontier of the wheat-growing industry which encroaches farther every year on the desert plains of the San Joaquin. Begrimed as we were, we gladly paid a dollar for a bath at the barber's shop, and then made our way through vast outworks of wheat-bags, piled around the railroad depôt, to a Pullman car which waits nightly in a siding at Madera for travellers from the Yosemite. We were sound asleep when the night train took us in tow, and the next morning found us once more in San Francisco.

Our American trip was over. A few days later we watched from the deck of the Pacific mail steamer, *City of Tokio*, the portals of the Golden Gate sliding from sight in the fog, and as the great ship rose and

fell on the waves of a strange and misty ocean, scarcely knew whether to look with more interest back to the New World with its restless civilization, or forward to the sight of cities, older than history, and the long-settled polity and culture of the mysterious East.

END OF VOL. I.

PRINTED BY WILLIAM CLOWES AND SONS, LIMITED, LONDON AND BECCLES.